

HANDBOOK OF JOB DESCRIPTIONS IN RURAL  
ACTIVITIES SUITABLE FOR THE

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To: Divisions of Vocational Rehabilitation (in States with no  
separate agency for the blind); Commissions and other  
Agencies for the Blind

Subject: Handbook of Job Descriptions in Rural Activities Suitable  
for the Employment of Blind Persons

The attached job description of a Specialty Farm for Raising  
Rabbits for Meat and Fur should be inserted in PART II-B as JOB NO. 4  
of the Handbook of Job Descriptions in Rural Activities Suitable for the  
Employment of Blind Persons.

This job like those already included in the Handbook was observed  
and tested by a blind member of the staff of the Services for the Blind  
Section.

Other materials are in preparation for release in the near future.

Donald H. Dabelstein  
ASSISTANT DIRECTOR

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SPECIALTY FARM

## RAISING RABBITS FOR MEAT AND FUR - USES CODE 3-07.60

The rabbit is a rodent-like mammal found all over Europe and in the British Isles. Introduced into Australia for game, it has become a dangerous pest. Of the several wild species native to North America, the most common is the cottontail found from coast to coast south of Canada. The Pacific Coast brush rabbit and the Southern swamp rabbit are closely related to the cottontail.

Rabbits are smaller than hares and have shorter ears and legs and smaller feet. The short tail is snowwhite underneath and when alarmed, the animal shows this little white puff or cottontail. The coat is brownish gray, the underparts white, the throat buff and the ears usually bordered with black.

In spite of their defenselessness and numerous enemies, wild rabbits survive close to civilization. They are very prolific and the young born naked appear in several litters each year. Four is the average and young of the first litter breed during the same year. Rabbits are fond of underbrush and nest in burrows for protection from foxes, owls and other enemies. They eat almost any green vegetation.

Domestic rabbit raising began in America in 1905 with the importing of Belgian Hares. The demand for rabbit meat and fur in the United States is increasing and growers over the nation are finding rabbit raising on a commercial basis to be a profitable enterprise. The future of the industry depends mainly upon continued production of food and fur in commercial quantities. Hutch raised rabbits are superior in texture, flavor and food value to wild rabbits and can be served throughout the entire year.

Rabbit and hare fur is of great commercial importance, 100,000,000 skins being used annually in the United States. Good rabbit skins are used for fur while hare and inferior rabbit skins are used for felt and glue. Rabbit fur is sold under such trade names as lapin, sealine, electric seal, leopardine, etc. Millions of dollars worth of rabbit meat is sold each year. In 1940, over \$1,300,000 worth was marketed in Los Angeles alone. Due to the meat shortage in the war years, this figure had increased to over \$5,000,000 by 1944.

Before the recent crisis, more than 100,000,000 skins were utilized annually. Of this number about 55,000,000 dressed and dyed were made into fur garments and into trimmings for women's coats, suits and dresses. The remainder, or skins not suitable for garments, were used as linings for men's and boys' gloves and in the manufacture of glue and felt. Prior to the war, about 98% of this enormous quantity of rabbit skins, valued at approximately \$25,000,000, was imported from Australia, New Zealand, Belgium, France and other foreign countries. The United States at present produces less than 2% of the number required to meet the demands of the American trade.

SPECIALTY FARM (Cont'd)

## 1. ACQUIRING STOCK

Stock can be acquired from various sources. It can be obtained from individuals, Associations or specialty growers of pedigreed stock, however, persons who are planning the development of a rabbitry should avail themselves of the experience and knowledge of recognized and successful growers and organizations dealing with research and experiment.

Reliable sources of information on the starting or foundation stock are: (1) a national organization of fanciers known as the American Rabbit and Cavet Breeders Association which has set up standards of 51 different breeds and varieties (the secretary of this organization has an office at 309 Whitefield Building 5914 Baum Boulevard, Pittsburgh 6, Pennsylvania. Persons desiring to raise pure-bred rabbits should write to the secretary for information); (2) the "Small Stock Magazine" is published at Lamoni, Iowa and contains information for rabbit raisers; (3) extensive research has been conducted at the United States Rabbit Experiment Station, Fontana, California, and persons desiring to purchase foundation stock should write the Director of this station for advice.

## 2. OPERATIONS INVOLVED AND FACTORS TO BE CONSIDERED

The following information was secured from a personal observation, analysis and performance of the operations involved at a rabbitry operated by Bert Stewart, a totally blind man of Mobile, Alabama; from a personal interview with him; from a comprehensive study of bulletins; books and journals published by the United States Bureau of Animal Industry, national organizations of growers and fanciers and from articles written by recognized and successful individuals.

Locality

In general it may be said that rabbits are grown successfully in practically every part of the country as they will stand both hot and cold weather and high and low altitudes provided they are given adequate seasonal shelter from winter, dampness, drafts and direct sunlight.

Rabbitries are now established in small towns, cities, in the vicinity of large cities, in rural districts and on poultry and general farms. If the grower is free to choose a location, the following factors should be considered: (1) It is advantageous to locate in a rabbit raising community. There are many small problems in management that can not be solved by an individual grower or through the study of written material but may be solved through exchange of information and organized effort. Such community concentration tends to decrease the difficulties experienced by the small grower in growing and marketing the stock. By raising a certain strain of rabbit, a whole community can build a reputation for its product that an individual could never hope for and buyers will make regular calls where unlimited quantities of the type and strain of rabbit they desire is available. (2) Good roads and transportation facilities are important considerations as they enable the grower to take advantage of fluctuating prices when marketing his product.



SPECIALTY FARM (Cont'd)Location of the Rabbitry

In order to facilitate construction and ease of operation, hutches and shelters should be built on reasonably level ground. The land should be well drained and have a gentle slope to the south as this will prevent dampness, give plenty of sunlight and fresh air and minimize the contraction of disease. If possible it should be placed in the shade of trees as this provides a feeling of ease and security for the rabbits, and protects them from the direct sunlight.

Plans should be made and space provided for possible expansion of the rabbitry. If the grower anticipates the raising of his own feed supply, it is important to consider the availability of land and the productivity of the soil.

Housing and Equipment

No definite type of house can be described to meet the conditions confronting growers in all parts of the country. The essentials in determining the kind to build are concerned with location, climate, extent of the business and the amount of money to be invested.

In establishing a rabbitry, one must keep in mind construction and equipment that will facilitate handling a certain number of rabbits with a minimum of manual labor; reducing the care required in feeding, handling and breeding practices; as well as cleaning the hutch and keeping the houses sanitary.

In the southern part of the United States, and other places where the climate is mild, it is not necessary to select a building in which to place the hutches. A roof constructed over them to give them shade and keep out the rain will meet most of the requirements. In the north, however, a structure is required to protect the does and the young against the winter.

The chief construction in the rabbitry consists of pens, nest boxes, hutches and shelter or houses in which the animals are protected from the elements. A garage, feed house or barn is suitable for this purpose.

The foundation and floor of the building to house the rabbitry should be of concrete to expedite the cleaning. There should be overhead ventilation and windows should be so arranged that they may be opened to permit free circulation of air in warm weather. The windows should face the south or southeast to give the greatest benefit from sunlight. An up-to-date poultry or hog house will furnish excellent plans for a rabbitry.

Water should be accessible to the rabbits and arrangements should be made for washing feed dishes. Electric lights facilitate the work of the grower in evening and early winter mornings. Feed bins, scale

SPECIALTY FARM (Cont'd)

and a place to handle and examine the rabbits are also required. The kind and quantity of equipment necessary depends entirely upon the scope of the undertaking and the number of rabbits kept.

The feed house may be a combination structure used to store grain, hay and crops and to mix rations. The hutches designed to serve for isolation and hospital pens should be placed at least 50 feet from the breeding hutches and should be so located that the person handling the feed for the regular stock need not come in contact with them.

There should be a separate room or building provided for dressing and preparing rabbits for market. It should have a floor of concrete, be tightly screened, contain dressing vats and work tables, be equipped with hot and cold water and meet every requirement of the health and sanitation commission.

Both metal and crockery dishes are used for feed and water. The dishes that are to serve for a water supply should be of such shape that the rabbits cannot tip them over. If the rabbit hutches are so constructed as to include a suitable manger for hay and a trough for grain food, it will not be necessary to place a dish for grain in the hutch.

Hutches—Numerous designs and styles of rabbit hutches have been used but none of them has yet proved to be entirely satisfactory in every detail. Hutches and nest boxes require frequent cleaning and spraying to keep them free from vermin and to protect the health of the animals. The construction, therefore, should be as simple as possible and ample provision should be made for light and air. Both the comfort of the animal and the convenience of the grower should be kept in mind in planning the construction.

The standard hutch is four feet long, two and one-half feet deep and two feet high to economize in space and to facilitate feeding and handling they are frequently built two tiers high. When more tiers are added they are inconvenient to reach, hard to clean and it becomes difficult to observe the animals in them.

The general lines of the outside hutch should be the same as those for an inside one, but it is advisable to use less wire and more wood in the front, and also to provide a winter screen of some kind. It may be in the form of a small hinged shutter for each hutch, or a longer one to slide in front of the whole stack at night during the inclement months of the year. In place of a wooden shutter, a canvas screen may be used as protection from the rough cold winters. This may be attached by means of hooks and rings.

It is easier to keep the hutch clean, dry and disinfected when 5/8" galvanized, 16-gauge hardware cloth or 1" metal slats spaced 1/2" apart are used for the floor. In the construction of double tier hutches sufficient space should be allowed for inserting a dropping tray under the floor of the upper hutches.



SPECIALTY FARM (Cont'd)

Plans for self-cleaning built-in hutches are available upon writing to the American Rabbit and Cat Breeders Association and all-metal sanitary hutches can be purchased. Many growers build their own hutches satisfactorily, however, it costs very little more to install the all-metal ones than to buy materials and have them constructed.

Nest boxes---A nest box should be constructed in a manner which permits thorough cleaning and disinfecting with a minimum of labor. The size required for the medium or giant breeds is approximately 12" deep, 12" high and 16" long. The closed top nest box is preferable for the colder climates and an open one for warmer climates. A board across the top at the rear end of the open top makes a convenient place for the doe to rest when the hutch is being cleaned or when she wants to get away from her litter.

An opening 6" x 6" or if circular, 7" in diameter, in the upper corner will be high enough from the bottom of the box to prevent the little ones from climbing out too soon and covering the edges with metal strips will prevent the doe from gnawing on it. With minor alterations, a nail keg may be made into an inexpensive yet satisfactory nest box.

The loss of newborn rabbits from freezing can be reduced by insulating. This may be done by placing the standard box inside of another that is large enough to leave a space of 3" between the sides and ends and packing with straw or excelsior.

Proper ventilation is necessary to prevent frost from accumulating and may be accomplished by boring two or more 1/2" holes through the center area of the inner box top and through the top of the outer box at the end opposite the entrance.

Choosing a Breed

Having decided upon the form of housing most suitable for the keeping of stock, the next consideration is the choosing of a breed. The rabbits best suited in size for the production of meat and fur are such medium and larger breeds as Flemish Giant, New Zealand, American, French, Belgium and Chinchilla. Any variety in the utility class, however, may be bred for commercial purposes and made to pay if properly fed, housed, and cared for although the breeds mentioned are considered the most important and profitable because of the combination of good fur and meat qualities.

White rabbits that are satisfactory meat producers are desirable because their skins bring high prices in the market and the color of the meat is not affected by the color of the rabbit. The American White, The American Blue, the New Zealand Red and the White Flemish are the varieties most extensively bred in the United States for meat and fur.

The animals chosen should be healthy. The signs of good health are a dry but not hot nose, firm flesh and a general appearance of youth and alertness. Before the initial stock is accepted, the animals should be carefully examined to see that the ears are erect and free of mange, the

### SPECIALTY FARM (Cont'd)

eyes full and bright, tail and feet straight and shapely and that the teeth are clean and meet nicely thus enabling the rabbit to chew its food properly. They should show no signs of scurvy, sneezing, a discharge from the nostrils or person soiled with mucous. Long coarse claws may be an indication of age.

If the rabbits selected are compact and meaty and have bone of fine quality, they give indication of high dressing properties. They should be from good producing stock, early maturing strains, and capable of producing large litters that will develop a marketable carcass at eight weeks of age.

### Proper Handling

Although it is necessary to occasionally stroke and handle rabbits, it should be done with great care and as seldom as possible. They should never be lifted by the ears or legs as handling in this manner may cause injury.

Small rabbits may be lifted and carried by grasping the loin region gently, yet firmly, with the heel of the hand toward the tail of the animal. Avoid bruising the flesh or damaging the skin.

Medium weight rabbits may be lifted and carried with the right hand by grasping the loose skin over the shoulders with the back of the rabbit toward the carrier and placing the left hand under the hind quarters so that most of the weight will be supported from beneath.

Heavy rabbits may be carried and prevented from struggling by grasping the fold of skin over the shoulders with the right hand, then lifting and holding the rabbit against the left side of the carrier with the animal's head under his left arm.

According to the report from the United States Rabbit Experiment Station in Fontana, California, many cases of paralyzed hind quarters are caused by improper handling.

### Breeding

The number of breeder rabbits and their young one person can handle depends upon the climatic conditions of the area in which the rabbitry is located, the kind and arrangement of equipment used, whether the rabbits are marketed as live animals, dressed carcasses or carcasses cut up into pieces and packaged. A good start for a beginner is a herd consisting of 10 does and 1 buck.

Rabbits will breed during any season of the year, however, early Spring is the normal breeding season. The highest percentage of conception occurs during February and March and the lowest in August, September and October.



SPECIALTY FARM (Cont'd)

Bucks of the small or medium type can be started in service at 6 to 7 months of age and the larger type at 10 months. Each buck should be given an individual hutch upon reaching the age of 4 months and thereafter kept separated from the other rabbits to prevent them from fighting. At maturity, 1 buck is sufficient for the mating of 10 does.

A young doe of small or medium type should be bred when 5 to 6 months of age and the larger type at 9 months. All does should be kept in separate hutches for at least 18 days before mating. Does give evidence of being ready for first matings by restlessness, nervousness, efforts to join other rabbits in nearby hutches, and rubbing the chin on the feed manger and water crocks.

Before mating, both the doe and the buck should be examined to make sure that they are free from disease. The doe should always be taken to the buck as she usually objects to other rabbits being placed in her hutch and may savagely attack and injure him. A breeding record should be made showing date of mating, name and number of bucks and does.

In commercial production of meat and fur, the breeding animals should be worked if possible throughout the year, with the gestation period thirty or thirty-two days and the nursing period eight weeks. This requires mating the does at the time the litters are weaned thus making it possible to produce four litters in a twelve-month period, the average litter being 8 young with an average mortality rate of 10%.

About two days after the young are kindled, they should be examined and any dead, undersized, or deformed should be removed from the nest box. Do not handle them more than is necessary as disturbance of the doe at kindling time or examination of the young immediately after birth very often results in the doe's refusal to feed and care for them.

Although young rabbits get their eyes open in 12 to 14 days, and begin to leave the nest, they should be kept there until they are three to four weeks old at which time they become interested in their mother's diet and are able to support themselves without undue strain on her milk supply.

On the average, the sex ratio is equal and growers desiring to increase their stock should separate male and female at 3 months of age and place them in a rearing pen. Much has been written on the subject of inbreeding of rabbits and there seems to be no definite information by which the grower can profit, however, the consensus is that inbreeding should only be practiced by growers who are large enough and financially able to experiment.

In commercial herds does properly cared for should breed until they are two and one-half to three years old but occasionally an individual may reproduce satisfactorily from four to six years. Bucks when properly cared for may be used for four or five years.

SPECIALTY FARM (Cont'd)Feeding

The production of food and good fur is the object of every rabbit grower. The most satisfactory ration must necessarily be made up of feeds that are wholesome, productive, relished by the rabbit and at the same time available at a reasonable cost. Fryer rabbits that have been developed rapidly and properly finished for the market weigh from 3 1/2 to 4 pounds at two months of age and will dress from 50 to 75 per cent of their live weight. They require 4 pounds of ration to produce 1 pound of meat and about 77 per cent of the product is edible.

As rabbits consume a variety of feeds there can be considerable latitude in selection. A ration may be made up of home grown grains, hay, greens and root crops that are of good quality and free from mold and smut. Little definite information is available concerning the mineral and vitamin requirements of rabbits. A mineral or vitamin deficiency is less likely to occur if the animals are supplied with a well-balanced ration. American rabbit breeders can follow uniformity of feeding as reliable data are available from such sources as the Eastern Fanciers Guide, Eastern Rabbit and Cavet Association, Somerville, New Jersey; the American Rabbit and Cavet Breeders Association, Pearl River, New York; and the United States Experiment Station, Fontana, California.

Many commercial feeds of well-balanced rations are also on the market and many growers feed these alone with good results.

It is impossible to set a formula for the feeding of all rabbits. Growers must study the individuals and take into consideration their food requirements depending upon their physical condition and stage of development. Regularity is more important than the number of feedings but once a system has been adopted, it should be adhered to.

A doe and her litter should have free access to leguminous hay of good quality, salt and fresh water at all times. To prevent waste and contamination of food, hay should be cut into short lengths and placed in the manger. A hay knife is inexpensive and convenient to use for this purpose as bales of hay can be cut at right angles to the wire thus saving time, space and keeping the store room free from litter.

Salt may be mixed with the hay or small commercial blocks can be placed in the hutch.

Inexpensive water dishes can be purchased or coffee cans may be used. Any water receptacle should be so placed that it can be easily removed, cannot be turned over or become contaminated. Dry does, herd bucks and developing does should be fed once a day only what they will consume readily within 20 to 30 minutes. Does and nursing litters should be given what they will consume without waste each 24 hours.



SPECIALTY FARM (Cont'd)Cleaning

Hutches that are kept clean and dry discourage disease and should be so constructed as to be readily cleaned. (SEE HOUSING AND EQUIPMENT) This also applies to feed troughs and hay racks and they should be so placed that the rabbits will not be able to contaminate them. No refuse of any kind should be permitted to accumulate in the hutches or nest boxes.

Droppings and moisture should not be permitted to collect in the hutches as they serve as a medium for the propagation of disease organisms. They should be cleaned and thoroughly scrubbed with a stiff brush every other day and disinfected at least once each week with a 5% solution of carbolic acid or other reliable antiseptic. Nest boxes should be cleaned, disinfected and fresh bedding supplied before the doe kindles. If the hutch has a wood floor, it should be scrubbed, sterilized and allowed to dry before returning the rabbits.

The feed and water containers should be scrubbed every other day with hot soapy water and immersed for 10 minutes in a chlorine solution made by mixing 1 tablespoon in 3 gallons of water.

Hutches from which diseased rabbits have been removed should be thoroughly cleaned and disinfected before they are again occupied. (SEE DISEASE)

Disease

The rabbit is allergic to comparatively few diseases and but a small per cent of these are fatal if taken in time. Successful rabbit raising depends not only on feeding and breeding but also on the ability of the grower to keep the animals free from disease. Losses may be avoided if the grower will rely on simple methods of cleanliness and management in maintaining health and vigor in the stock. Rabbits are raised in close confinement from the time they are born until they are raised to the age to be disposed of. Because of the close contact in which they are placed, they are in a position to contract disease readily from infected animals. Rabbits frequently fail to show symptoms of disease until after their condition has become very serious.

The prevention of disease in rabbits is of special importance not only because of the fact that many of their diseases are preventable but because curative treatment is less successful than with many other classes of stock.

Hutches that are kept clean, dry and free from refuse do not favor the development of disease. It is essential that the hutches be so constructed as to be readily cleaned. This applies to all equipment including feed troughs and hay racks, which should be so placed that the rabbits cannot contaminate them. The droppings are a source of potential trouble because they frequently contain parasites--worm eggs and disease germs.

SPECIALTY FARM (Cont'd)

Before new stock is placed in the hutches they should be isolated and examined thoroughly for any symptoms of disease. Special hutches for this purpose should be placed at a distance of 50 to 100 feet from where other rabbits are housed.

At the present time, effective treatments are known for very few of the rabbit diseases. This is especially true of coccidiosis and snuffles. It is simpler, therefore, and usually better to destroy a few animals that are sickly than to attempt to treat them or to run the chance of spreading infection to healthy stock. It is advisable to burn immediately, any rabbit that dies from an unknown infectious disease as well as all droppings and bedding material used by them.

The treatment of disease, however, calls for the services of a competent veterinary. Special training is required to diagnose disease and to administer potent drugs and as a rule the rabbit grower is not equipped to do this type of work. Some of the most common diseases listed below can be treated successfully by the grower.

Ear Canker or Scabs

This is the most common rabbit trouble and the least dangerous with a little attention immediately on discovery.

Symptoms---The rabbit will wash its ears more than usual. Look down into the ear and see if any scales appear. Feel the base of the ears to see if they are hot. The rabbit will also shake its head.

Occasionally, it will dig at the ear with the hind foot. Finally in the last stages, the ear will droop and the fur will be lost from the back of it. Death may shortly result if nothing is done but the disease need never go as far as this.

Cause---A germ lodged in the ear.

Remedy---A few drops of sweet or camphorated oil twice a day, until the scab disappears, generally the third day, or melt a little carbolated vaseline and pour into the ear being sure that you can readily bear the back of your little finger in it so that it will not be too hot.

Sore Hocks

Symptoms---The rabbit has a tendency to pound the foot down on the bottom of the hutch occasionally as before. A little later the animal will limp and finally sit humped in the corner and refuse to eat.

Cause---Damp or dirty hutches. Too strong disinfectant on the floor or a nail in the floor.

Remedy---Hold the animal's leg and foot in water as hot as you can bear on the back of your hand. Keep it hot by adding a little hot water occasionally. Soak fifteen minutes and dry carefully not exposing the

SPECIALTY FARM (Cont'd)

animal to any drafts meanwhile. Open any gathered places and clean out with peroxide or borax water. Dry and apply warm carbolated vaseline or sulphur.

### Abscesses

Seldom fatal if cared for.

Symptoms---Raising under the skin, rather hard at first. Later they get soft and if not attended to will burst making a bad odor in the hutch and danger of infection.

Causes---A scratch from a nail, a bite from another animal or opening caused from pulling fur too fast to line nest.

Remedy---As soon as the abscess is softened well get a pan of hot water, a sharp knife whetted very keen, some peroxide or listerine and the carboalted vaseline.

Open the abscess at the side near the base, so that all the pus may be squeezed out. See that your hands have no scratches on them or cuts to take infection. After the abscess is emptied, pour in a good quantity of the peroxide or listerine. Wash out with warm water and fill the opening with carbolated vaseline, squeezing out the surplus. Place the rabbit in a disinfected hutch, with two inches of straw on the floor and clean water and feed dishes with plenty of cool water.

### Colds (First Stage)

Symptoms---A cold in a rabbit is first noticeable as a catarrh. They will sneeze and sometimes a light mucuous will run from the nose, yet they will be lively and eat well, deceiving the owner into disregarding it sometimes resulting in the loss of the whole rabbitry through contagion of the disease in its later or snuffle stage.

Cause---The cause is generally dampness of the hutches, heavy draft through the hutches or a change while the doe is still half naked from nesting. The doe should if possible not be changed about after she has pulled fur for a nest for at least two weeks.

Remedy---Clean out and disinfect a warm draft-tight hutch. Put the animal on its back and treat it with cold remedies dropping the remedy in each nostril. Hold the animal until the oil has had a good chance to penetrate the spot or the nasal cavities thoroughly. Put two drops of tincture of aconite in each pail of water given the rabbit. Disinfect the hutch every day, feeding dainties such as bread crumbs, greens, but do so sparingly.

### Bloat and Diarrhea

Symptoms---Swelling of intestinal cavities and excessive looseness of the bowels.



SPECIALTY FARM (Cont'd)

Cause---Feeding of Damp hay, overeating followed by the over-drinking of cold water, exposure to dampness and cold.

Remedy---Remove feed from 12 to 24 hours thus giving the stomach time to empty before additional intake is provided.

Paralyzed Hind Quarters

Cause---Although paralyzed hind quarters is not a disease, it does require treatment. This condition is usually the result of bodily injury caused by improper handling of the rabbit or an attempt to escape from its natural enemies such as snakes, rats, strange dogs, cats, etc.

Treatment---Because of the nature of the injury, it is impossible to administer medical treatment. The rabbit should be made as comfortable as possible and fed a well-balanced ration that contains a small quantity of fresh green feed. If improvement is not noticeable within a week or ten days, the rabbit should be destroyed to prevent unnecessary suffering.

Infected animals that are to be treated should be isolated and housed in clean and disinfected quarters. The hutches and nest boxes from which they have been removed and their feed and water dishes should be cleaned and disinfected with a 3% solution of creosole compound or a 5% carbolic acid or other suitable disinfectant. No rabbit should be returned to these hutches until the grower can be reasonably sure that they have been completely rid of disease germs.

Dressing for Market

A special room equipped to meet the requirements of the health and sanitation commission should be provided for the purpose of dressing the rabbit. (SEE HOUSING AND EQUIPMENT) A copy of the regulations governing the slaughtering and marketing of rabbits may be obtained from the local county or city health office. The following procedure is commonly practiced by rabbit growers.

Fasten a board containing a row of meat hooks placed about 8" apart horizontally across one wall and far enough away to permit the carcass to swing free so that blood will not touch the pelt. Rabbits are usually killed by breaking the neck. This is accomplished by holding the rabbit by its hind legs, head down, back toward you and giving the head a quick downward pull by grasping it at the base of the ears and at the same time twisting it backward and to one side. Another neck breaking method is to hold the rabbit across the loin or by the hind legs with the head down and striking it a sharp blow just behind the ears.

After breaking the neck, hang the rabbit by the heavy pad of one hind foot or between the tendon and bone of one hind leg at the hock joint and cut off the head close to the ears. Break the joint of the hind leg not affixed to the hook and cut it off by bringing the knife away from you and diagonally downward; pull the pelt away from the hind leg affixed to the hook, insert the knife near the vent and slit the hide



SPECIALTY FARM (Cont'd)

up to the joint; pull pelt free at the joint and strip the pelt from the other hind leg, work the fingers under the pelt across the back and pull it free from the tail; bring tail forward between legs and cut it off; grasp pelt and pull it downward; pull pelt over the shoulders and cut off all surplus fat. Insert the knife at the junction of the hind legs and cut the bone, cutting downward to the brisket taking care not to cut the intestines and pull the large intestine loose at the opening. The remainder will come away easily, leaving kidneys and liver in place. Drop intestines in container and remove gall bladder and cut off the remaining hind leg. Wash the carcass and place in a vat or tub to cool to remove body heat. After cooling remove the carcass from the vat and place in container for storage.

The following method of dressing rabbits has been devised and is being effectively practiced by Bert Stewart, a totally blind man and successful operator of a rabbitry in Mobile, Alabama.

One back foot of the rabbit is hung by a loop in a small cord which is located directly over the vat. The rabbit is killed by tapping the head with a ballpeen hammer; the head is cut off leaving the neck as long as possible (this practice gives added weight to the carcass); the back leg which is free is cut off at the first joint and the foot removed. The rabbit is then placed on paper which covers the drain board to keep the pelt free from blood and the remaining three legs removed. The thumb is then inserted beneath the pelt at the back of the neck and worked around to one front leg and the pelt removed. The same operation is repeated for the remaining front leg.

The rabbit is held by the right hand across the back at the shoulders and the pelt stripped glove fashion. The thumb nail is used to break the meat of the stomach and an opening made wide enough to remove the gall bladder from the liver. While holding the rabbit in the left hand, remove the stomach and intestines with the right. The tail is then pulled off thus removing and cleaning the last canal. The carcass is then rinsed in running water and the bladder and skin removed after which it is placed in cold water to bleach and usually adds something to the weight. By the use of this method, the heart, lungs, kidneys, liver and the membrane covering the stomach and lung cavities are not removed. Since the operations involved in the use of the above system requires excessive handling of the carcass, it is necessary to wash the hands frequently to keep them free of fur which would adhere to the flesh.

By-Products

Careful consideration should be given to the value of the by-products of the rabbit industry and thrifty growers have learned that a large percentage of the operating costs can be defrayed through this source.

Pelts---Pelts when properly cared for are in demand and bring an average of 12¢ to 30¢ each depending upon the grade and quantity. For best results, rabbit skins are "shaped" and dried by placing them over a wire fur stretcher made from NO. 7 galvanized steel wire. They should be placed on

SPECIALTY FARM (Cont'd)

a stretcher immediately after they have been taken from the animal and while still warm. A skin that is allowed to lie and become cold, contracts and hardens, and when dry it will show wrinkles or creases which lessens its sale value. The flesh side of the pelt should be kept out and fur turned in with the four legs on one side and the back on the other. If stretched with the wire in the middle of the back, the wire will sometimes injure the most valuable part of the fur. The stretcher should not be forced into the pelt unnecessarily as the spring in the wire is so made as to shape the skin properly. The pelt sometimes has a tendency to curl but this can usually be prevented by dipping it into water before stretching. After the skin is placed on the stretcher, it should be carefully examined to see that all folds and wrinkles are smoothed out, that the bottom of the skin stretches and dries flat and that superfluous fat is removed.

The loop of the stretcher should project through the opening at the top, and the piece of neck skin, or dewlap, be pulled up and the skin from the four legs straightened out so that these parts do not dry fast to the body of the pelt. Clothes pins may be used for the purpose.

Hang them up on stretchers in a shady place where air circulates freely, making sure that they do not touch each other and are out of reach of rats or mice. They should not be removed from stretchers until "bone dry", and this process usually requires three or four days. When thoroughly dry, the skins are removed from the stretchers. They should never be placed in a pile, but should be kept in a dry, cool place until ready for shipment.

The best way to keep skins from spoiling during this interval is to tie the top ends together, making bundles of 50 or less and hanging them from a beam or post away from rats, mice or insects. During the summer or in a warm climate, the skins should be well sprinkled with naphthalene, paradichlorobenzene or other pest solution and covered with paper. Skins should be disposed of promptly but if they must be kept any length of time, it is necessary to repeat the application of the treatment.

Heads---Heads are sold to fox and mink farmers; for laboratory use; and for dog feed.

Tails---Tails are sold to hatters for decorative purposes.

Feet---Feet are used in the production of novelty items and also by hatters.

Fertilizer---The value of animal manure is based on returns from vegetable gardens as established by experiments conducted by the United States Department of Agriculture. Rabbit manure is high in nitrogen content and depending upon the feed consumed and climatic conditions, sells for \$12.00 to \$15.00 a ton.



SPECIALTY FARM (Cont'd)

Manure produced from rabbits raised under intensive feeding conditions is highly productive and demands higher prices. It may be sold as fresh manure or dried, ground and sold in packages and if the grower practices selling heads and entrails as fertilizer, they may be mixed with fresh manure and degenerated by adding a chemical element.

Fish Worms---Since the soil beneath fertilizer beds is moist and naturally conducive to the propagation of worms, one grower (a totally blind man) has developed a thriving business in the selling of fish bait. He imported 20,000 worms from a commercial grower and has planted them in the native soil where cross-breeding takes place and the worms multiply very rapidly.

Unit Plan---The following plan is being successfully practiced: The grower farms out a unit of 10 does and 1 buck of which he retains ownership and from which he receives one eight-week-old doe from each of the litters of each of the 10 does. He also agrees to purchase live weight any number of the remaining litter at prevailing market prices. This plan nets the owner forty eight-week-old does each calendar year and provides him with a source from which to buy live weight and sell dressed to the consumer.

Laboratory---Rabbits can be sold to hospitals, physicians and laboratories for experimental purposes. This same successful grower is now furnishing a physician with a minimum of 12 rabbits a month for which he receives \$2.50 each and is planning to extend this service.

Cost

No attempt is made to estimate the cost of land or the construction of buildings as these items will vary greatly depending upon the extent of the project, locality and conditions. Smaller projects may be established on land and in buildings already available, therefore eliminating this primary consideration.

Rabbitries are divided into three classifications: (a) the backyard rabbitry; (b) the larger part-time suburban rabbit farm; and (c) the full-time commercial business. It is impossible to estimate the cost of establishing a particular rabbitry, therefore, these estimates will be confined to a single unit consisting of 10 does and 1 buck. The following figures have been compiled and compared with estimates submitted by Marcellus W. Meek in his book which was published in 1947, entitled "Rabbit Raising for Profit".

Since labor and material costs vary in different sections of the country, hutch costs can be estimated only in general terms. When hutches are constructed by the grower, the cost of lumber; 1" mesh poultry netting for the sides, front and doors; 5/8" mesh hardware cloth for floors; hinges nails, and screws should not exceed \$4.00 per breeding compartment. Ready-built hutches, or those constructed by hired labor may exceed \$6.00 to \$7.50 per compartment.

SPECIALTY FARM (Cont'd)

At this rate, the cost of hutches (including one for a hospital) for a unit of 10 does and 1 buck would average \$48.00 to build or \$84.00 to purchase.

Rabbits of a standard utility grade, either does or bucks, can be purchased for \$5.00 each or a unit of 10 does and 1 buck for a total of \$55.00. This would indicate an approximate cost of \$139.00 for an initial unit of 10 does and 1 buck with their hutches.

Recognized authorities on the raising of rabbits for meat production, estimate that it takes an average of 4 pounds of ration to produce 1 pound of meat. (This quantity includes all feed used from the time the doe is mated until the fryers are weaned at two months of age with an average weight of about four pounds each.)

If we take the high figure of 15¢ a pound for feed which Mr. Meek used in compiling his table for feed costs, it would indicate that the cost of feeding one doe and an average litter of 8 young (32 pounds) to market age (eight weeks) would be \$4.80. Thus a unit of 10 does and her litter plus an estimated cost of \$2.00 for feeding the buck would be approximately \$50.00.

The above figures total \$189.00 and represent the estimated amount required to purchase 10 does and 1 buck, their hutches and the necessary feed to raise the first litters to marketable age and weight.

Marketing

Rabbits are grown and sold during the entire year and may be marketed either live weight or dressed. They may be sold direct to the consumer; at roadside stands; to local butchers, hospitals, markets, hotels, clubs, restaurants, or any other outlet where meat is bought in quantities. Many dealers supplying the wholesale consumer trade with dressed rabbits have established routes for collecting the livestock from the grower.

It is better to be able to supply the dealer with a large number of fryers at stated intervals than to have a scattered few at each call, as the overhead cost of collection by the dealer must be considered.

Many wholesale poultry dealers and market commission houses in large cities handle shipments of meat rabbits along with poultry, pigeons and other farm produce.

Growers with larger production facilities usually build up their own retail and wholesale markets independently of rabbit collectors and butchers. One advantage of this practice is that the grower does his own butchering and realizes added income from the dressing of the rabbit as well as from the sale of the by-products.

If a cooperative association of rabbit growers exists in the immediate locality, it is a good practice to become a member as it is their express purpose to aid the grower in securing better prices on both the purchase of feed and on the sale of the product.



SPECIALTY FARM (Cont'd)

## 3. REMARKS

The above information was secured from a personal observation of a rabbit project owned and operated by Bert Stewart, a totally blind man of Mobile, Alabama; through the study of materials published by the United States Bureau of Animal Industry; rabbit growers' associations; and from the study of books published by recognized authorities on the rabbit industry.

Authorities agree on all phases of the industry and there is a mass of authentic information available in rabbit journals; books; and bulletins released by the United States Bureau of Animal Industry. Any person contemplating the establishing of a rabbitry should take advantage of the vast amount of research which has been conducted in the various parts of the country.

Irrespective of sight, it is necessary to call for the services of a veterinarian in administering treatment for certain forms of disease, (SEE DISEASE), however, sight is not necessary for the performance of the daily operations involved in the raising of rabbits.

This project has been proven practical through the personal demonstration by a totally blind operator who has been successful and actively engaged in the business for several years and all the operations involved were observed, analyzed and performed by a totally blind staff member of the Section, Services for the Blind.

## 4. BIBLIOGRAPHY

The following books and publications are compiled as a representative list for the information of the rabbit grower:

Periodicals and Bulletins

American Small Stock Farmer, Pearl River, New York  
American Rabbit Journal, Warrenton, Missouri  
California Rabbits Magazine, 942 East Lambert Avenue, El Monte, California  
For Better Rabbits, RFD #5, Box 229, Phoenix, Arizona  
Medina Commercial Rabbit Journal, RFD #2, Wadsworth, Ohio  
The New Jersey Rabbit Journal, Box #82, New Vernon, New Jersey  
Small Stock Magazine, Lamoni, Iowa  
The Toledo Rabbit News, 6669 Convent Boulevard, Sylvania, Ohio  
The American Rabbit and Cavet Association Bulletin #9, Secretary, 309  
Whitefield Building, 5914 Baum Boulevard, Pittsburgh 6, Pennsylvania

Books

How to Raise Rabbits for Food and Fur, Frank G. Ashbrook - Price \$2.00  
Rabbit Raising for Profit, Marcellus W. Meek, Price \$4.00  
Commercial Rabbit Raising, M. H. Brossia - Price \$3.00  
(All available through W. E. Moyer Supply House, Milton, Pennsylvania)  
Cashing in on Rabbits, American Small Stock Farmer, Pearl River, N. Y., \$.50  
Raising Rabbits for Profit, Edward H. Stahl, American Small Stock Farmer,  
Pearl River, New York - Price \$.50

SPECIALTY FARM (Cont'd)

## 5. JOB SPECIFICATIONS

Tasks Performed

The operator obtains the various types of feed including the concentrate and succulents from source of supply and has it conveniently stored in his rabbitry or adjacent thereto.

He measures or weighs the feed and places the concentrate feed into the feeder. He fills the water containers. Green food is placed in the hutches. The hutches are kept clean, sanitary, and in good repair.

He keeps simple records of his expenses and income.

He must constantly watch for the first sign of disease. He sells his stock by contacting his customers by letter, phone or in person.

## 6. REQUIREMENTS

PHYSICAL:	Age—Active Standing and walking most of the time Bending a little as required to feed and care for animals
FEET:	Ability to walk, stand, and stoop
HANDS:	The Use of both
THUMBS:	The use of one or both
FINGERS:	Index, middle, and ring finger on one hand or both
VISION:	No vision required in the daily processes of work
HEARING:	When the worker is blind, hearing is required
MENTAL:	Alertness, good memory, coordination, and ordinary pace
EDUCATION:	Understanding of the English language. Ability to read and write is important but could be secured or supplied by a member of the family

## PHYSICAL ENVIRONMENT

Usually in small buildings, such as chicken house, barn or garage. No noise. Works alone or with sighted help as required.



FEDERAL SECURITY AGENCY  
Office of Vocational Rehabilitation  
Washington 25, D. C.

October 15, 1948

REHABILITATION SERVICE SERIES NUMBER 52 - SUPPLEMENT 2

To: Divisions of Vocational Rehabilitation (in States with no  
separate agency for the blind); Commissions and other  
Agencies for the Blind

Subject: Handbook of Job Descriptions in Rural Activities Suitable  
for the Employment of Blind Persons

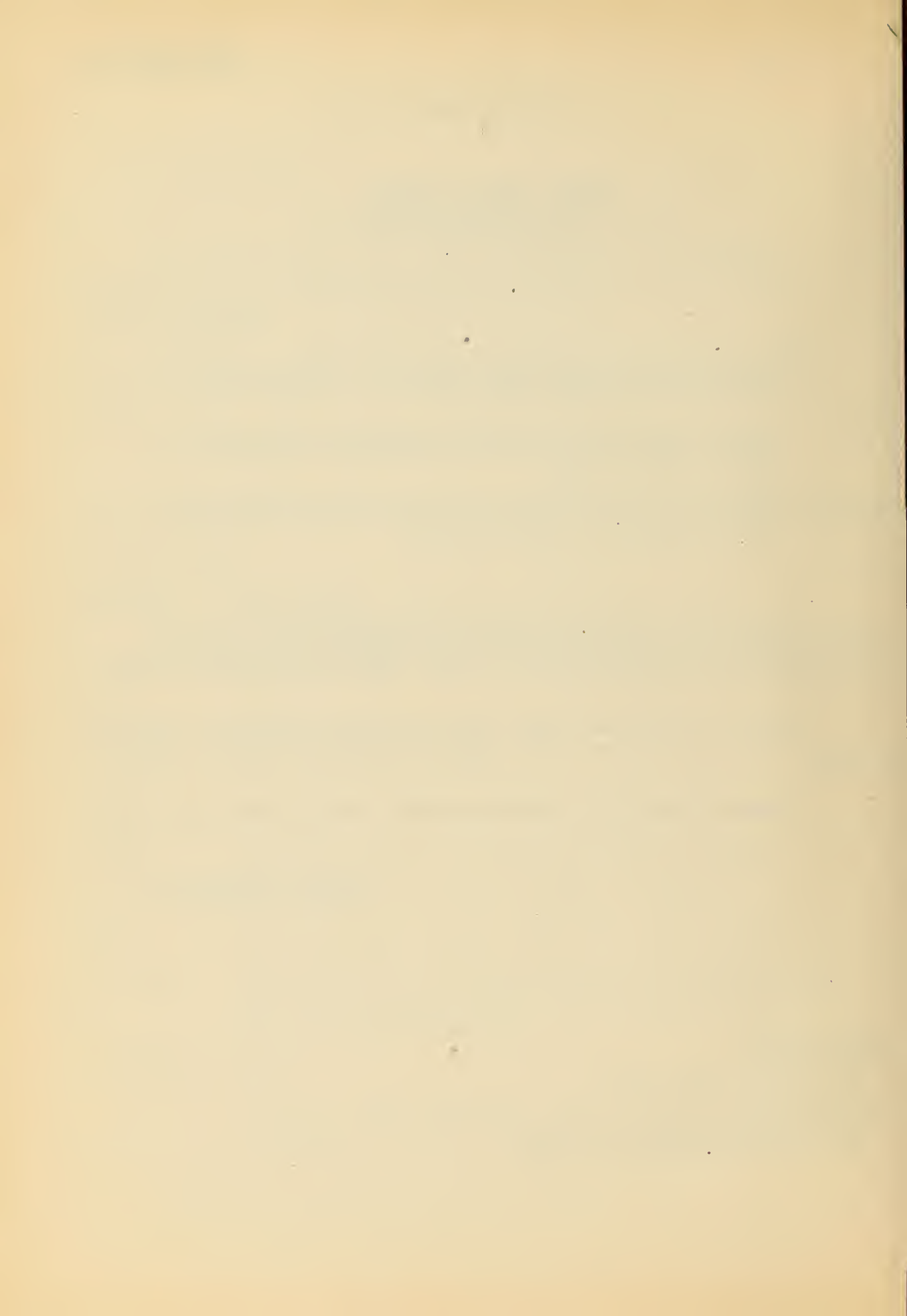
The attached job description of a Specialty Farm for Raising  
Rabbits for Meat and Fur should be inserted in PART II-B as JOB NO. 4  
of the Handbook of Job Descriptions in Rural Activities Suitable for the  
Employment of Blind Persons.

This job like those already included in the Handbook was observed  
and tested by a blind member of the staff of the Services for the Blind  
Section.

Other materials are in preparation for release in the near future.

Donald H. Dabelstein  
ASSISTANT DIRECTOR

DISTRIBUTION  
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SPECIALTY FARM

## RAISING RABBITS FOR MEAT AND FUR - USES CODE 3-07.60

The rabbit is a rodent-like mammal found all over Europe and in the British Isles. Introduced into Australia for game, it has become a dangerous pest. Of the several wild species native to North America, the most common is the cottontail found from coast to coast south of Canada. The Pacific Coast brush rabbit and the Southern swamp rabbit are closely related to the cottontail.

Rabbits are smaller than hares and have shorter ears and legs and smaller feet. The short tail is snowwhite underneath and when alarmed, the animal shows this little white puff or cottontail. The coat is brownish gray, the underparts white, the throat buff and the ears usually bordered with black.

In spite of their defenselessness and numerous enemies, wild rabbits survive close to civilization. They are very prolific and the young born naked appear in several litters each year. Four is the average and young of the first litter breed during the same year. Rabbits are fond of underbrush and nest in burrows for protection from foxes, owls and other enemies. They eat almost any green vegetation.

Domestic rabbit raising began in America in 1905 with the importing of Belgian Hares. The demand for rabbit meat and fur in the United States is increasing and growers over the nation are finding rabbit raising on a commercial basis to be a profitable enterprise. The future of the industry depends mainly upon continued production of food and fur in commercial quantities. Hutch raised rabbits are superior in texture, flavor and food value to wild rabbits and can be served throughout the entire year.

Rabbit and hare fur is of great commercial importance, 100,000,000 skins being used annually in the United States. Good rabbit skins are used for fur while hare and inferior rabbit skins are used for felt and glue. Rabbit fur is sold under such trade names as lapin, sealine, electric seal, leopardine, etc. Millions of dollars worth of rabbit meat is sold each year. In 1940, over \$1,300,000 worth was marketed in Los Angeles alone. Due to the meat shortage in the war years, this figure had increased to over \$5,000,000 by 1944.

Before the recent crisis, more than 100,000,000 skins were utilized annually. Of this number about 55,000,000 dressed and dyed were made into fur garments and into trimmings for women's coats, suits and dresses. The remainder, or skins not suitable for garments, were used as linings for men's and boys' gloves and in the manufacture of glue and felt. Prior to the war, about 98% of this enormous quantity of rabbit skins, valued at approximately \$25,000,000, was imported from Australia, New Zealand, Belgium, France and other foreign countries. The United States at present produces less than 2% of the number required to meet the demands of the American trade.



SPECIALTY FARM (Cont'd)

## 1. ACQUIRING STOCK

Stock can be acquired from various sources. It can be obtained from individuals, Associations or specialty growers of pedigreed stock, however, persons who are planning the development of a rabbitry should avail themselves of the experience and knowledge of recognized and successful growers and organizations dealing with research and experiment.

Reliable sources of information on the starting or foundation stock are: (1) a national organization of fanciers known as the American Rabbit and Cavet Breeders Association which has set up standards of 51 different breeds and varieties (the secretary of this organization has an office at 309 Whitefield Building 5914 Baum Boulevard, Pittsburgh 6, Pennsylvania. Persons desiring to raise pure-bred rabbits should write to the secretary for information); (2) the "Small Stock Magazine" is published at Lamoni, Iowa and contains information for rabbit raisers; (3) extensive research has been conducted at the United States Rabbit Experiment Station, Fontana, California, and persons desiring to purchase foundation stock should write the Director of this station for advice.

## 2. OPERATIONS INVOLVED AND FACTORS TO BE CONSIDERED

The following information was secured from a personal observation, analysis and performance of the operations involved at a rabbitry operated by Bert Stewart, a totally blind man of Mobile, Alabama; from a personal interview with him; from a comprehensive study of bulletins; books and journals published by the United States Bureau of Animal Industry, national organizations of growers and fanciers and from articles written by recognized and successful individuals.

Locality

In general it may be said that rabbits are grown successfully in practically every part of the country as they will stand both hot and cold weather and high and low altitudes provided they are given adequate seasonal shelter from winter, dampness, drafts and direct sunlight.

Rabbitries are now established in small towns, cities, in the vicinity of large cities, in rural districts and on poultry and general farms. If the grower is free to choose a location, the following factors should be considered: (1) It is advantageous to locate in a rabbit raising community. There are many small problems in management that can not be solved by an individual grower or through the study of written material but may be solved through exchange of information and organized effort. Such community concentration tends to decrease the difficulties experienced by the small grower in growing and marketing the stock. By raising a certain strain of rabbit, a whole community can build a reputation for its product that an individual could never hope for and buyers will make regular calls where unlimited quantities of the type and strain of rabbit they desire is available. (2) Good roads and transportation facilities are important considerations as they enable the grower to take advantage of fluctuating prices when marketing his product.

SPECIALTY FARM (Cont'd)Location of the Rabbitry

In order to facilitate construction and ease of operation, hutches and shelters should be built on reasonably level ground. The land should be well drained and have a gentle slope to the south as this will prevent dampness, give plenty of sunlight and fresh air and minimize the contraction of disease. If possible it should be placed in the shade of trees as this provides a feeling of ease and security for the rabbits, and protects them from the direct sunlight.

Plans should be made and space provided for possible expansion of the rabbitry. If the grower anticipates the raising of his own feed supply, it is important to consider the availability of land and the productivity of the soil.

Housing and Equipment

No definite type of house can be described to meet the conditions confronting growers in all parts of the country. The essentials in determining the kind to build are concerned with location, climate, extent of the business and the amount of money to be invested.

In establishing a rabbitry, one must keep in mind construction and equipment that will facilitate handling a certain number of rabbits with a minimum of manual labor; reducing the care required in feeding, handling and breeding practices; as well as cleaning the hutch and keeping the houses sanitary.

In the southern part of the United States, and other places where the climate is mild, it is not necessary to select a building in which to place the hutches. A roof constructed over them to give them shade and keep out the rain will meet most of the requirements. In the north, however, a structure is required to protect the does and the young against the winter.

The chief construction in the rabbitry consists of pens, nest boxes, hutches and shelter or houses in which the animals are protected from the elements. A garage, feed house or barn is suitable for this purpose.

The foundation and floor of the building to house the rabbitry should be of concrete to expedite the cleaning. There should be overhead ventilation and windows should be so arranged that they may be opened to permit free circulation of air in warm weather. The windows should face the south or southeast to give the greatest benefit from sunlight. An up-to-date poultry or hog house will furnish excellent plans for a rabbitry.

Water should be accessible to the rabbits and arrangements should be made for washing feed dishes. Electric lights facilitate the work of the grower in evening and early winter mornings. Feed bins, scale



SPECIALTY FARM (Cont'd)

and a place to handle and examine the rabbits are also required. The kind and quantity of equipment necessary depends entirely upon the scope of the undertaking and the number of rabbits kept.

The feed house may be a combination structure used to store grain, hay and crops and to mix rations. The hutches designed to serve for isolation and hospital pens should be placed at least 50 feet from the breeding hutches and should be so located that the person handling the feed for the regular stock need not come in contact with them.

There should be a separate room or building provided for dressing and preparing rabbits for market. It should have a floor of concrete, be tightly screened, contain dressing vats and work tables, be equipped with hot and cold water and meet every requirement of the health and sanitation commission.

Both metal and crockery dishes are used for feed and water. The dishes that are to serve for a water supply should be of such shape that the rabbits cannot tip them over. If the rabbit hutches are so constructed as to include a suitable manger for hay and a trough for grain food, it will not be necessary to place a dish for grain in the hutch.

Hutches—Numerous designs and styles of rabbit hutches have been used but none of them has yet proved to be entirely satisfactory in every detail. Hutches and nest boxes require frequent cleaning and spraying to keep them free from vermin and to protect the health of the animals. The construction, therefore, should be as simple as possible and ample provision should be made for light and air. Both the comfort of the animal and the convenience of the grower should be kept in mind in planning the construction.

The standard hutch is four feet long, two and one-half feet deep and two feet high to economize in space and to facilitate feeding and handling they are frequently built two tiers high. When more tiers are added they are inconvenient to reach, hard to clean and it becomes difficult to observe the animals in them.

The general lines of the outside hutch should be the same as those for an inside one, but it is advisable to use less wire and more wood in the front, and also to provide a winter screen of some kind. It may be in the form of a small hinged shutter for each hutch, or a longer one to slide in front of the whole stack at night during the inclement months of the year. In place of a wooden shutter, a canvas screen may be used as protection from the rough cold winters. This may be attached by means of hooks and rings.

It is easier to keep the hutch clean, dry and disinfected when 5/8" galvanized, 16-gauge hardware cloth or 1" metal slats spaced 1/2" apart are used for the floor. In the construction of double tier hutches sufficient space should be allowed for inserting a dropping tray under the floor of the upper hutches.



### SPECIALTY FARM (Cont'd)

Plans for self-cleaning built-in hutches are available upon writing to the American Rabbit and Cat Breeders Association and all-metal sanitary hutches can be purchased. Many growers build their own hutches satisfactorily, however, it costs very little more to install the all-metal ones than to buy materials and have them constructed.

Nest boxes---A nest box should be constructed in a manner which permits thorough cleaning and disinfecting with a minimum of labor. The size required for the medium or giant breeds is approximately 12" deep, 12" high and 16" long. The closed top nest box is preferable for the colder climates and an open one for warmer climates. A board across the top at the rear end of the open top makes a convenient place for the doe to rest when the hutch is being cleaned or when she wants to get away from her litter.

An opening 6" x 6" or if circular, 7" in diameter, in the upper corner will be high enough from the bottom of the box to prevent the little ones from climbing out too soon and covering the edges with metal strips will prevent the doe from gnawing on it. With minor alterations, a nail keg may be made into an inexpensive yet satisfactory nest box.

The loss of newborn rabbits from freezing can be reduced by insulating. This may be done by placing the standard box inside of another that is large enough to leave a space of 3" between the sides and ends and packing with straw or excelsior.

Proper ventilation is necessary to prevent frost from accumulating and may be accomplished by boring two or more 1/2" holes through the center area of the inner box top and through the top of the outer box at the end opposite the entrance.

### Choosing a Breed

Having decided upon the form of housing most suitable for the keeping of stock, the next consideration is the choosing of a breed. The rabbits best suited in size for the production of meat and fur are such medium and larger breeds as Flemish Giant, New Zealand, American, French, Belgium and Chinchilla. Any variety in the utility class, however, may be bred for commercial purposes and made to pay if properly fed, housed, and cared for although the breeds mentioned are considered the most important and profitable because of the combination of good fur and meat qualities.

White rabbits that are satisfactory meat producers are desirable because their skins bring high prices in the market and the color of the meat is not affected by the color of the rabbit. The American White, The American Blue, the New Zealand Red and the White Flemish are the varieties most extensively bred in the United States for meat and fur.

The animals chosen should be healthy. The signs of good health are a dry but not hot nose, firm flesh and a general appearance of youth and alertness. Before the initial stock is accepted, the animals should be carefully examined to see that the ears are erect and free of mange, the

### SPECIALTY FARM (Cont'd)

eyes full and bright, tail and feet straight and shapely and that the teeth are clean and meet nicely thus enabling the rabbit to chew its food properly. They should show no signs of scurvy, sneezing, a discharge from the nostrils or person soiled with mucous. Long coarse claws may be an indication of age.

If the rabbits selected are compact and meaty and have bone of fine quality, they give indication of high dressing properties. They should be from good producing stock, early maturing strains, and capable of producing large litters that will develop a marketable carcass at eight weeks of age.

### Proper Handling

Although it is necessary to occasionally stroke and handle rabbits, it should be done with great care and as seldom as possible. They should never be lifted by the ears or legs as handling in this manner may cause injury.

Small rabbits may be lifted and carried by grasping the loin region gently, yet firmly; with the heel of the hand toward the tail of the animal. Avoid bruising the flesh or damaging the skin.

Medium weight rabbits may be lifted and carried with the right hand by grasping the loose skin over the shoulders with the back of the rabbit toward the carrier and placing the left hand under the hind quarters so that most of the weight will be supported from beneath.

Heavy rabbits may be carried and prevented from struggling by grasping the fold of skin over the shoulders with the right hand, then lifting and holding the rabbit against the left side of the carrier with the animal's head under his left arm.

According to the report from the United States Rabbit Experiment Station in Fontana, California, many cases of paralyzed hind quarters are caused by improper handling.

### Breeding

The number of breeder rabbits and their young one person can handle depends upon the climatic conditions of the area in which the rabbitry is located, the kind and arrangement of equipment used, whether the rabbits are marketed as live animals, dressed carcasses or carcasses cut up into pieces and packaged. A good start for a beginner is a herd consisting of 10 does and 1 buck.

Rabbits will breed during any season of the year, however, early Spring is the normal breeding season. The highest percentage of conception occurs during February and March and the lowest in August, September and October.



SPECIALTY FARM (Cont'd)

Bucks of the small or medium type can be started in service at 6 to 7 months of age and the larger type at 10 months. Each buck should be given an individual hutch upon reaching the age of 4 months and thereafter kept separated from the other rabbits to prevent them from fighting. At maturity, 1 buck is sufficient for the mating of 10 does.

A young doe of small or medium type should be bred when 5 to 6 months of age and the larger type at 9 months. All does should be kept in separate hutches for at least 18 days before mating. Does give evidence of being ready for first matings by restlessness, nervousness, efforts to join other rabbits in nearby hutches, and rubbing the chin on the feed manger and water crocks.

Before mating, both the doe and the buck should be examined to make sure that they are free from disease. The doe should always be taken to the buck as she usually objects to other rabbits being placed in her hutch and may savagely attack and injure him. A breeding record should be made showing date of mating, name and number of bucks and does.

In commercial production of meat and fur, the breeding animals should be worked if possible throughout the year, with the gestation period thirty or thirty-two days and the nursing period eight weeks. This requires mating the does at the time the litters are weaned thus making it possible to produce four litters in a twelve-month period, the average litter being 8 young with an average mortality rate of 10%.

About two days after the young are kindled, they should be examined and any dead, undersized, or deformed should be removed from the nest box. Do not handle them more than is necessary as disturbance of the doe at kindling time or examination of the young immediately after birth very often results in the doe's refusal to feed and care for them.

Although young rabbits get their eyes open in 12 to 14 days, and begin to leave the nest, they should be kept there until they are three to four weeks old at which time they become interested in their mother's diet and are able to support themselves without undue strain on her milk supply.

On the average, the sex ratio is equal and growers desiring to increase their stock should separate male and female at 3 months of age and place them in a rearing pen. Much has been written on the subject of inbreeding of rabbits and there seems to be no definite information by which the grower can profit, however, the consensus is that inbreeding should only be practiced by growers who are large enough and financially able to experiment.

In commercial herds does properly cared for should breed until they are two and one-half to three years old but occasionally an individual may reproduce satisfactorily from four to six years. Bucks when properly cared for may be used for four or five years.



SPECIALTY FARM (Cont'd)Feeding

The production of food and good fur is the object of every rabbit grower. The most satisfactory ration must necessarily be made up of feeds that are wholesome, productive, relished by the rabbit and at the same time available at a reasonable cost. Fryer rabbits that have been developed rapidly and properly finished for the market weigh from 3 1/2 to 4 pounds at two months of age and will dress from 50 to 75 per cent of their live weight. They require 4 pounds of ration to produce 1 pound of meat and about 77 per cent of the product is edible.

As rabbits consume a variety of feeds there can be considerable latitude in selection. A ration may be made up of home grown grains, hay, greens and root crops that are of good quality and free from mold and smut. Little definite information is available concerning the mineral and vitamin requirements of rabbits. A mineral or vitamin deficiency is less likely to occur if the animals are supplied with a well-balanced ration. American rabbit breeders can follow uniformity of feeding as reliable data are available from such sources as the Eastern Fanciers Guide, Eastern Rabbit and Cavet Association, Somerville, New Jersey; the American Rabbit and Cavet Breeders Association, Pearl River, New York; and the United States Experiment Station, Fontana, California.

Many commercial feeds of well-balanced rations are also on the market and many growers feed these alone with good results.

It is impossible to set a formula for the feeding of all rabbits. Growers must study the individuals and take into consideration their food requirements depending upon their physical condition and stage of development. Regularity is more important than the number of feedings but once a system has been adopted, it should be adhered to.

A doe and her litter should have free access to leguminous hay of good quality, salt and fresh water at all times. To prevent waste and contamination of food, hay should be cut into short lengths and placed in the manger. A hay knife is inexpensive and convenient to use for this purpose as bales of hay can be cut at right angles to the wire thus saving time, space and keeping the store room free from litter.

Salt may be mixed with the hay or small commercial blocks can be placed in the hutch.

Inexpensive water dishes can be purchased or coffee cans may be used. Any water receptacle should be so placed that it can be easily removed, cannot be turned over or become contaminated. Dry does, herd bucks and developing does should be fed once a day only what they will consume readily within 20 to 30 minutes. Does and nursing litters should be given what they will consume without waste each 24 hours.

SPECIALTY FARM (Cont'd)Cleaning

Hutches that are kept clean and dry discourage disease and should be so constructed as to be readily cleaned. (SEE HOUSING AND EQUIPMENT) This also applies to feed troughs and hay racks and they should be so placed that the rabbits will not be able to contaminate them. No refuse of any kind should be permitted to accumulate in the hutches or nest boxes.

Droppings and moisture should not be permitted to collect in the hutches as they serve as a medium for the propagation of disease organisms. They should be cleaned and thoroughly scrubbed with a stiff brush every other day and disinfected at least once each week with a 5% solution of carbolic acid or other reliable antiseptic. Nest boxes should be cleaned, disinfected and fresh bedding supplied before the doe kindles. If the hutch has a wood floor, it should be scrubbed, sterilized and allowed to dry before returning the rabbits.

The feed and water containers should be scrubbed every other day with hot soapy water and immersed for 10 minutes in a chlorine solution made by mixing 1 tablespoon in 3 gallons of water.

Hutches from which diseased rabbits have been removed should be thoroughly cleaned and disinfected before they are again occupied. (SEE DISEASE)

Disease

The rabbit is allergic to comparatively few diseases and but a small per cent of these are fatal if taken in time. Successful rabbit raising depends not only on feeding and breeding but also on the ability of the grower to keep the animals free from disease. Losses may be avoided if the grower will rely on simple methods of cleanliness and management in maintaining health and vigor in the stock. Rabbits are raised in close confinement from the time they are born until they are raised to the age to be disposed of. Because of the close contact in which they are placed, they are in a position to contract disease readily from infected animals. Rabbits frequently fail to show symptoms of disease until after their condition has become very serious.

The prevention of disease in rabbits is of special importance not only because of the fact that many of their diseases are preventable but because curative treatment is less successful than with many other classes of stock.

Hutches that are kept clean, dry and free from refuse do not favor the development of disease. It is essential that the hutches be so constructed as to be readily cleaned. This applies to all equipment including feed troughs and hay racks, which should be so placed that the rabbits cannot contaminate them. The droppings are a source of potential trouble because they frequently contain parasites--worm eggs and disease germs.

SPECIALTY FARM (Cont'd)

Before new stock is placed in the hutches they should be isolated and examined thoroughly for any symptoms of disease. Special hutches for this purpose should be placed at a distance of 50 to 100 feet from where other rabbits are housed.

At the present time, effective treatments are known for very few of the rabbit diseases. This is especially true of coccidiosis and snuffles. It is simpler, therefore, and usually better to destroy a few animals that are sickly than to attempt to treat them or to run the chance of spreading infection to healthy stock. It is advisable to burn immediately, any rabbit that dies from an unknown infectious disease as well as all droppings and bedding material used by them.

The treatment of disease, however, calls for the services of a competent veterinary. Special training is required to diagnose disease and to administer potent drugs and as a rule the rabbit grower is not equipped to do this type of work. Some of the most common diseases listed below can be treated successfully by the grower.

#### Ear Canker or Scabs

This is the most common rabbit trouble and the least dangerous with a little attention immediately on discovery.

Symptoms---The rabbit will wash its ears more than usual. Look down into the ear and see if any scales appear. Feel the base of the ears to see if they are hot. The rabbit will also shake its head.

Occasionally, it will dig at the ear with the hind foot. Finally in the last stages, the ear will droop and the fur will be lost from the back of it. Death may shortly result if nothing is done but the disease need never go as far as this.

Cause---A germ lodged in the ear.

Remedy---A few drops of sweet or camphorated oil twice a day, until the scab disappears, generally the third day, or melt a little carbolated vaseline and pour into the ear being sure that you can readily bear the back of your little finger in it so that it will not be too hot.

#### Sore Hocks

Symptoms---The rabbit has a tendency to pound the foot down on the bottom of the hutch occasionally as before. A little later the animal will limp and finally sit humped in the corner and refuse to eat.

Cause---Damp or dirty hutches. Too strong disinfectant on the floor or a nail in the floor.

Remedy---Hold the animal's leg and foot in water as hot as you can bear on the back of your hand. Keep it hot by adding a little hot water occasionally. Soak fifteen minutes and dry carefully not exposing the



SPECIALTY FARM (Cont'd)

animal to any drafts meanwhile. Open any gathered places and clean out with peroxide or borax water. Dry and apply warm carbolated vaseline or sulphur.

### Abscesses

Seldom fatal if cared for.

Symptoms---Raising under the skin, rather hard at first. Later they get soft and if not attended to will burst making a bad odor in the hutch and danger of infection.

Causes---A scratch from a nail, a bite from another animal or opening caused from pulling fur too fast to line nest.

Remedy---As soon as the abscess is softened well get a pan of hot water, a sharp knife whetted very keen, some peroxide or listerine and the carboalted vaseline.

Open the abscess at the side near the base, so that all the pus may be squeezed out. See that your hands have no scratches on them or cuts to take infection. After the abscess is emptied, pour in a good quantity of the peroxide or listerine. Wash out with warm water and fill the opening with carbolated vaseline, squeezing out the surplus. Place the rabbit in a disinfected hutch, with two inches of straw on the floor and clean water and feed dishes with plenty of cool water.

### Colds (First Stage)

Symptoms---A cold in a rabbit is first noticeable as a catarrh. They will sneeze and sometimes a light mucuous will run from the nose, yet they will be lively and eat well, deceiving the owner into disregarding it sometimes resulting in the loss of the whole rabbitry through contagion of the disease in its later or snuffle stage.

Cause---The cause is generally dampness of the hutches, heavy draft through the hutches or a change while the doe is still half naked from nesting. The doe should if possible not be changed about after she has pulled fur for a nest for at least two weeks.

Remedy---Clean out and disinfect a warm draft-tight hutch. Put the animal on its back and treat it with cold remedies dropping the remedy in each nostril. Hold the animal until the oil has had a good chance to penetrate the spot or the nasal cavities thoroughly. Put two drops of tincture of aconite in each pail of water given the rabbit. Disinfect the hutch every day, feeding dainties such as bread crumbs, greens, but do so sparingly.

### Bloat and Diarrhea

Symptoms---Swelling of intestinal cavities and excessive looseness of the bowels.

SPECIALTY FARM (Cont'd)

Cause---Feeding of Damp hay, overeating followed by the over-drinking of cold water, exposure to dampness and cold.

Remedy---Remove feed from 12 to 24 hours thus giving the stomach time to empty before additional intake is provided.

Paralyzed Hind Quarters

Cause---Although paralyzed hind quarters is not a disease, it does require treatment. This condition is usually the result of bodily injury caused by improper handling of the rabbit or an attempt to escape from its natural enemies such as snakes, rats, strange dogs, cats, etc.

Treatment---Because of the nature of the injury, it is impossible to administer medical treatment. The rabbit should be made as comfortable as possible and fed a well-balanced ration that contains a small quantity of fresh green feed. If improvement is not noticeable within a week or ten days, the rabbit should be destroyed to prevent unnecessary suffering.

Infected animals that are to be treated should be isolated and housed in clean and disinfected quarters. The hutches and nest boxes from which they have been removed and their feed and water dishes should be cleaned and disinfected with a 3% solution of creosole compound or a 5% carbolic acid or other suitable disinfectant. No rabbit should be returned to these hutches until the grower can be reasonably sure that they have been completely rid of disease germs.

Dressing for Market

A special room equipped to meet the requirements of the health and sanitation commission should be provided for the purpose of dressing the rabbit. (SEE HOUSING AND EQUIPMENT) A copy of the regulations governing the slaughtering and marketing of rabbits may be obtained from the local county or city health office. The following procedure is commonly practiced by rabbit growers.

Fasten a board containing a row of meat hooks placed about 8" apart horizontally across one wall and far enough away to permit the carcass to swing free so that blood will not touch the pelt. Rabbits are usually killed by breaking the neck. This is accomplished by holding the rabbit by its hind legs, head down, back toward you and giving the head a quick downward pull by grasping it at the base of the ears and at the same time twisting it backward and to one side. Another neck breaking method is to hold the rabbit across the loin or by the hind legs with the head down and striking it a sharp blow just behind the ears.

After breaking the neck, hang the rabbit by the heavy pad of one hind foot or between the tendon and bone of one hind leg at the hock joint and cut off the head close to the ears. Break the joint of the hind leg not affixed to the hook and cut it off by bringing the knife away from you and diagonally downward; pull the pelt away from the hind leg affixed to the hook, insert the knife near the vent and slit the hide



SPECIALTY FARM (Cont'd)

up to the joint; pull pelt free at the joint and strip the pelt from the other hind leg, work the fingers under the pelt across the back and pull it free from the tail; bring tail forward between legs and cut it off; grasp pelt and pull it downward; pull pelt over the shoulders and cut off all surplus fat. Insert the knife at the junction of the hind legs and cut the bone, cutting downward to the brisket taking care not to cut the intestines and pull the large intestine loose at the opening. The remainder will come away easily, leaving kidneys and liver in place. Drop intestines in container and remove gall bladder and cut off the remaining hind leg. Wash the carcass and place in a vat or tub to cool to remove body heat. After cooling remove the carcass from the vat and place in container for storage.

The following method of dressing rabbits has been devised and is being effectively practiced by Bert Stewart, a totally blind man and successful operator of a rabbitry in Mobile, Alabama.

One back foot of the rabbit is hung by a loop in a small cord which is located directly over the vat. The rabbit is killed by tapping the head with a ballpeen hammer; the head is cut off leaving the neck as long as possible (this practice gives added weight to the carcass); the back leg which is free is cut off at the first joint and the foot removed. The rabbit is then placed on paper which covers the drain board to keep the pelt free from blood and the remaining three legs removed. The thumb is then inserted beneath the pelt at the back of the neck and worked around to one front leg and the pelt removed. The same operation is repeated for the remaining front leg.

The rabbit is held by the right hand across the back at the shoulders and the pelt stripped glove fashion. The thumb nail is used to break the meat of the stomach and an opening made wide enough to remove the gall bladder from the liver. While holding the rabbit in the left hand, remove the stomach and intestines with the right. The tail is then pulled off thus removing and cleaning the last canal. The carcass is then rinsed in running water and the bladder and skin removed after which it is placed in cold water to bleach and usually adds something to the weight. By the use of this method, the heart, lungs, kidneys, liver and the membrane covering the stomach and lung cavities are not removed. Since the operations involved in the use of the above system requires excessive handling of the carcass, it is necessary to wash the hands frequently to keep them free of fur which would adhere to the flesh.

By-Products

Careful consideration should be given to the value of the by-products of the rabbit industry and thrifty growers have learned that a large percentage of the operating costs can be defrayed through this source.

Pelts---Pelts when properly cared for are in demand and bring an average of 12¢ to 30¢ each depending upon the grade and quantity. For best results, rabbit skins are "shaped" and dried by placing them over a wire fur stretcher made from NO. 7 galvanized steel wire. They should be placed on



SPECIALTY FARM (Cont'd)

a stretcher immediately after they have been taken from the animal and while still warm. A skin that is allowed to lie and become cold, contracts and hardens, and when dry it will show wrinkles or creases which lessens its sale value. The flesh side of the pelt should be kept out and fur turned in with the four legs on one side and the back on the other. If stretched with the wire in the middle of the back, the wire will sometimes injure the most valuable part of the fur. The stretcher should not be forced into the pelt unnecessarily as the spring in the wire is so made as to shape the skin properly. The pelt sometimes has a tendency to curl but this can usually be prevented by dipping it into water before stretching. After the skin is placed on the stretcher, it should be carefully examined to see that all folds and wrinkles are smoothed out, that the bottom of the skin stretches and dries flat and that superfluous fat is removed.

The loop of the stretcher should project through the opening at the top, and the piece of neck skin, or dewlap, be pulled up and the skin from the four legs straightened out so that these parts do not dry fast to the body of the pelt. Clothes pins may be used for the purpose.

Hang them up on stretchers in a shady place where air circulates freely, making sure that they do not touch each other and are out of reach of rats or mice. They should not be removed from stretchers until "bone dry", and this process usually requires three or four days. When thoroughly dry, the skins are removed from the stretchers. They should never be placed in a pile, but should be kept in a dry, cool place until ready for shipment.

The best way to keep skins from spoiling during this interval is to tie the top ends together, making bundles of 50 or less and hanging them from a beam or post away from rats, mice or insects. During the summer or in a warm climate, the skins should be well sprinkled with naphthalene, paradichlorobenzene or other pest solution and covered with paper. Skins should be disposed of promptly but if they must be kept any length of time, it is necessary to repeat the application of the treatment.

Heads---Heads are sold to fox and mink farmers; for laboratory use; and for dog feed.

Tails---Tails are sold to hatters for decorative purposes.

Feet---Feet are used in the production of novelty items and also by hatters.

Fertilizer---The value of animal manure is based on returns from vegetable gardens as established by experiments conducted by the United States Department of Agriculture. Rabbit manure is high in nitrogen content and depending upon the feed consumed and climatic conditions, sells for \$12.00 to \$15.00 a ton.

SPECIALTY FARM (Cont'd)

Manure produced from rabbits raised under intensive feeding conditions is highly productive and demands higher prices. It may be sold as fresh manure or dried, ground and sold in packages and if the grower practices selling heads and entrails as fertilizer, they may be mixed with fresh manure and degenerated by adding a chemical element.

Fish Worms---Since the soil beneath fertilizer beds is moist and naturally conducive to the propagation of worms, one grower (a totally blind man) has developed a thriving business in the selling of fish bait. He imported 20,000 worms from a commercial grower and has planted them in the native soil where cross-breeding takes place and the worms multiply very rapidly.

Unit Plan---The following plan is being successfully practiced: The grower farms out a unit of 10 does and 1 buck of which he retains ownership and from which he receives one eight-week-old doe from each of the litters of each of the 10 does. He also agrees to purchase live weight any number of the remaining litter at prevailing market prices. This plan nets the owner forty eight-week-old does each calender year and provides him with a source from which to buy live weight and sell dressed to the consumer.

Laboratory---Rabbits can be sold to hospitals, physicians and laboratories for experimental purposes. This same successful grower is now furnishing a physician with a minimum of 12 rabbits a month for which he receives \$2.50 each and is planning to extend this service.

Cost

No attempt is made to estimate the cost of land or the construction of buildings as these items will vary greatly depending upon the extent of the project, locality and conditions. Smaller projects may be established on land and in buildings already available, therefore eliminating this primary consideration.

Rabbitries are divided into three classifications: (a) the backyard rabbitry; (b) the larger part-time suburban rabbit farm; and (c) the full-time commercial business. It is impossible to estimate the cost of establishing a particular rabbitry, therefore, these estimates will be confined to a single unit consisting of 10 does and 1 buck. The following figures have been compiled and compared with estimates submitted by Marcellus W. Meek in his book which was published in 1947, entitled "Rabbit Raising for Profit".

Since labor and material costs vary in different sections of the country, hutch costs can be estimated only in general terms. When hutches are constructed by the grower, the cost of lumber; 1" mesh poultry netting for the sides, front and doors; 5/8" mesh hardware cloth for floors; hinges nails, and screws should not exceed \$4.00 per breeding compartment. Ready-built hutches, or those constructed by hired labor may exceed \$6.00 to \$7.50 per compartment.



SPECIALTY FARM (Cont'd)

At this rate, the cost of hutches (including one for a hospital) for a unit of 10 does and 1 buck would average \$48.00 to build or \$84.00 to purchase.

Rabbits of a standard utility grade, either does or bucks, can be purchased for \$5.00 each or a unit of 10 does and 1 buck for a total of \$55.00. This would indicate an approximate cost of \$139.00 for an initial unit of 10 does and 1 buck with their hutches.

Recognized authorities on the raising of rabbits for meat production, estimate that it takes an average of 4 pounds of ration to produce 1 pound of meat. (This quantity includes all feed used from the time the doe is mated until the fryers are weaned at two months of age with an average weight of about four pounds each.)

If we take the high figure of 15¢ a pound for feed which Mr. Meek used in compiling his table for feed costs, it would indicate that the cost of feeding one doe and an average litter of 8 young (32 pounds) to market age (eight weeks) would be \$4.80. Thus a unit of 10 does and her litter plus an estimated cost of \$2.00 for feeding the buck would be approximately \$50.00.

The above figures total \$189.00 and represent the estimated amount required to purchase 10 does and 1 buck, their hutches and the necessary feed to raise the first litters to marketable age and weight.

Marketing

Rabbits are grown and sold during the entire year and may be marketed either live weight or dressed. They may be sold direct to the consumer; at roadside stands; to local butchers, hospitals, markets, hotels, clubs, restaurants, or any other outlet where meat is bought in quantities. Many dealers supplying the wholesale consumer trade with dressed rabbits have established routes for collecting the livestock from the grower.

It is better to be able to supply the dealer with a large number of fryers at stated intervals than to have a scattered few at each call, as the overhead cost of collection by the dealer must be considered.

Many wholesale poultry dealers and market commission houses in large cities handle shipments of meat rabbits along with poultry, pigeons and other farm produce.

Growers with larger production facilities usually build up their own retail and wholesale markets independently of rabbit collectors and butchers. One advantage of this practice is that the grower does his own butchering and realizes added income from the dressing of the rabbit as well as from the sale of the by-products.

If a cooperative association of rabbit growers exists in the immediate locality, it is a good practice to become a member as it is their express purpose to aid the grower in securing better prices on both the purchase of feed and on the sale of the product.



SPECIALTY FARM (Cont'd)

## 3. REMARKS

The above information was secured from a personal observation of a rabbit project owned and operated by Bert Stewart, a totally blind man of Mobile, Alabama; through the study of materials published by the United States Bureau of Animal Industry; rabbit growers' associations; and from the study of books published by recognized authorities on the rabbit industry.

Authorities agree on all phases of the industry and there is a mass of authentic information available in rabbit journals; books; and bulletins released by the United States Bureau of Animal Industry. Any person contemplating the establishing of a rabbitry should take advantage of the vast amount of research which has been conducted in the various parts of the country.

Irrespective of sight, it is necessary to call for the services of a veterinarian in administering treatment for certain forms of disease, (SEE DISEASE), however, sight is not necessary for the performance of the daily operations involved in the raising of rabbits.

This project has been proven practical through the personal demonstration by a totally blind operator who has been successful and actively engaged in the business for several years and all the operations involved were observed, analyzed and performed by a totally blind staff member of the Section, Services for the Blind.

## 4. BIBLIOGRAPHY

The following books and publications are compiled as a representative list for the information of the rabbit grower:

Periodicals and Bulletins

American Small Stock Farmer, Pearl River, New York  
American Rabbit Journal, Warrenton, Missouri  
California Rabbits Magazine, 942 East Lambert Avenue, El Monte, California  
For Better Rabbits, RFD #5, Box 229, Phoenix, Arizona  
Medina Commercial Rabbit Journal, RFD #2, Wadsworth, Ohio  
The New Jersey Rabbit Journal, Box #32, New Vernon, New Jersey  
Small Stock Magazine, Lamoni, Iowa  
The Toledo Rabbit News, 6669 Convent Boulevard, Sylvania, Ohio  
The American Rabbit and Cavet Association Bulletin #9, Secretary, 309  
Whitefield Building, 5914 Baum Boulevard, Pittsburgh 6, Pennsylvania

Books

How to Raise Rabbits for Food and Fur, Frank G. Ashbrook - Price \$2.00  
Rabbit Raising for Profit, Marcellus W. Meek, Price \$4.00  
Commercial Rabbit Raising, M. H. Brossia - Price \$3.00  
(All available through W. E. Moyer Supply House, Milton, Pennsylvania)  
Cashing in on Rabbits, American Small Stock Farmer, Pearl River, N. Y., \$.50  
Raising Rabbits for Profit, Edward H. Stahl, American Small Stock Farmer,  
Pearl River, New York - Price \$.50

SPECIALTY FARM (Cont'd)

## 5. JOB SPECIFICATIONS

Tasks Performed

The operator obtains the various types of feed including the concentrate and succulents from source of supply and has it conveniently stored in his rabbitry or adjacent thereto.

He measures or weighs the feed and places the concentrate feed into the feeder. He fills the water containers. Green food is placed in the hutches. The hutches are kept clean, sanitary, and in good repair.

He keeps simple records of his expenses and income.

He must constantly watch for the first sign of disease. He sells his stock by contacting his customers by letter, phone or in person.

## 6. REQUIREMENTS

PHYSICAL:	Age—Active Standing and walking most of the time Bending a little as required to feed and care for animals
FEET:	Ability to walk, stand, and stoop
HANDS:	The Use of both
THUMBS:	The use of one or both
FINGERS:	Index, middle, and ring finger on one hand or both
VISION:	No vision required in the daily processes of work
HEARING:	When the worker is blind, hearing is required
MENTAL:	Alertness, good memory, coordination, and ordinary pace
EDUCATION:	Understanding of the English language. Ability to read and write is important but could be secured or supplied by a member of the family

## PHYSICAL ENVIRONMENT

Usually in small buildings, such as chicken house, barn or garage. No noise. Works alone or with sighted help as required.

FEDERAL SECURITY AGENCY  
Office of Vocational Rehabilitation  
Washington, D. C.

January 9, 1950

REHABILITATION SERVICE SERIES NUMBER 52 - SUPPLEMENT 4

TO: Divisions of Vocational Rehabilitation (in states with no separate agency for the blind); Commissions and other Agencies for the Blind.

SUBJECT: Handbook of Job Descriptions in Rural Activities Suitable for the Employment of Blind Persons

The attached job description of a Specialty Farm for Growing Garlic Commercially--USES Code 3-09.10 should be inserted in PART II-B JOB NO. 6 of the Handbook of Job Descriptions in Rural Activities Suitable for the Employment of Blind Persons.

This job like those already included in the Handbook was observed and tested by a blind member of the staff of the Services for the Blind Branch.

Other materials are in preparation for release in the near future.

*D. H. Dabelstein*  
Donald H. Dabelstein  
ASSISTANT DIRECTOR

DISTRIBUTION  
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Redistribution  
District Supervisors  
All Counselors Serving  
the Blind





SPECIALTY FARM

## GROWING GARLIC FOR COMMERCIAL USE--USES CODE 3-09.10

Garlic (*Allium sativum*) is a small perennial plant of the lilly family closely allied to the common onion and native probably to southern Europe. It has been cultivated since ancient times for its bulbous root and is extensively used in Southern Europe and in most oriental countries as a seasoning in salads and stews, also, the oil of garlic is valued in medicine. The strong-colored, pungent tasting bulb is composed of several small bulblets, known as cloves, enclosed within a sheath. From the bulb grow flat basal leaves and a slender flower stock, 1 to 2 feet high, bearing a dense spherical cluster of long-stemmed flowers, interspersed with numerous small bulblets.

Three distinct varieties are being grown in the United States. These are the Creole or American; the Italian, which in some areas, particularly in California, is called Mexican; and a variety known as Tahiti, which produces a large bulb containing 4 or 5 very large cloves. The Creole or American variety grows much taller than the Italian, and the skin that surrounds the cloves is distinctly white. It also produces a larger yield to the acre than the Italian; the latter is smaller in plant growth and in bulb. The individual cloves are many, and the sheath covering them is usually pink. The Italian variety usually matures about two weeks earlier than the Creole or American. The bulb of the Tahiti variety is 2 to 3 inches in diameter; the leaves look very much like those of the other two varieties named.

Although the growth of garlic had its origin in southern Louisiana, with proper care and treatment it is now being grown successfully in all parts of the country, with the chief commercial gardens being in the Gulf and Pacific Coast States. The domestic acreage of garlic is now about 4,000 acres, and the average yield is reported as being  $48\frac{1}{2}$  bags of 100 pounds each, or 4,850 pounds, to the acre. The total production is in the neighborhood of 19,400,000 pounds; this is less than present market requirements, and considerable quantities of garlic are imported.

## A. ACQUIRING STOCK

The initial stock of seed or bulbs required for the starting of a garlic bed can be ordered from any seed company distributing certified products; from local seed stores and greenhouses; and from individual growers already established in the industry.

SPECIALTY FARM (Cont'd)

The State Extension Service can advise regarding seed and bulbs which have been acclimated and are adapted to a particular type of soil, and the local county agent can furnish the grower with technical advice and information regarding their treatment and care.

#### OPERATIONS INVOLVED AND FACTORS TO BE CONSIDERED IN THE GROWING OF GARLIC

The following information was obtained from a personal interview with Mr. George Whidden, a commercial gardener, with experience in Maryland and Michigan; from personal observation and analysis of the operations involved in pulling, cleaning, and grading garlic; from personal experience acquired through planting, cultivating, and harvesting garden crops which require similar treatment to garlic; and from the study of bulletins and pamphlets released on the subject by the United States Department of Agriculture.

##### A. SELECTION OF STRAIN

Three varieties of garlic are commercially grown in the United States (1) the Creole or American, (2) the Italian or Mexican, and (3) the Tahiti.

The Creole or American variety grows much taller than the Italian, the skin that surrounds it is distinctly white, and it produces a larger yield to the acre than the Italian. The Italian or Mexican variety is smaller in both plant growth and bulb than the American, the individual cloves are many, the sheath is usually pink, and it matures about two weeks earlier than the Creole or American variety. The bulb of the Tahiti variety is two to three inches in diameter, the leaves look very much like those of leek and are also more resistant to thrips than those of the other two varieties.

Before making a selection the grower should consult the County Agent in his area regarding the particular variety which is most adaptable to the soil and climatic conditions; and investigate the general market trends and sources of local demand to determine the size, color, and strength of bulb which is most desirable.



SPECIALTY FARM (Cont'd)

## B. CLIMATE

Garlic is best adapted to the warmer sections of the country where growing conditions prevail throughout the winter, however, with proper care it is being successfully grown in the northern states where the climate is cold and the growing season is short.

## C. SOIL

Garlic is grown mainly on rich, well-drained, alluvial soils, mostly of the lighter sandy types found near a river. Soils that are adapted for the growing of onions will, as a rule, produce good garlic. Many of the onion growers follow the practice of planting beds of garlic adjoining those of onions. The crop may, however, be grown on a rather wide range of soil types, the essentials being good drainage and an abundance of organic matter in the soil.

Many of the growers on the rich alluvial river lands follow the practice of plowing under a crop of cowpeas and do not use commercial fertilizers. Under conditions where it would be necessary to supplement such natural manures as cowpeas with commercial fertilizers in the production of onions, the same treatment should be followed for garlic. The main essential is to have an abundant supply of organic matter in the soil, then supplement it as required by applications of fertilizer. A fertilizer containing 5 per cent of nitrogen, 10 percent of phosphoric acid, and 4 to 6 per cent of potash may be profitably used at the rate of 800 to 1,200 pounds to the acre.

The advice of the local County Agent should be sought regarding the needs of a particular type of soil to be cultivated.

## D. PLANTING

In the warmer sections of the country where the growing season prevails throughout the winter, garlic is planted in October and November while in the more northern states, the planting should be done in the early spring months of April and May.

After the ground has been well spaded or plowed and the soil thoroughly mulched by means of a rake or harrow, it should be ridged or bedded depending upon the system to be used. Various systems are used in different parts of the country and most of them are satisfactory. The important factors are a plot which is

SPECIALTY FARM (Cont'd)

well drained and soil adapted to the growing of garlic.

In the majority of plots where horse drawn or power driven equipment is used, for cultivating, ridging is most common. The ridges are frequently 5 feet in width and contain 2 or 3 rows of garlic. Where hand cultivation is practiced, the system of bedding is most common and the rows are planted 15 to 18 inches apart. Blind persons should plant the rows at least 24 inches apart in order to avoid stepping on the plants when cultivating.

Garlic cloves are usually planted from 4 to 6 inches apart in the row depending on the strength of the soil. Under most conditions, 6 inches is close enough. The clove is pressed into the soil with the fingers with the base pointing downward. The usual depth of planting is 1 to 2 inches. The cloves must not be so deep that the soil will interfere with the swelling of the bulb nor so shallow that the rain will wash them out of the ground. In order to keep the rows straight and properly spaced as to width, the blind person can stretch a string or wire over the entire length of the plot moving the wire as each row is completed. The desired depth of planting can be determined by measuring with the finger.

Since the cloves of the garlic bulb are variable in size, it is well to assort them and plant the various sizes in separate rows so that they will run more uniform at maturity.

One successful grower in the St. Louis, Missouri area plants in September or October and covers the rows with 1 inch of chicken droppings. The garlic does not freeze out and often shows through the snow in the early spring. The strong manure kills the weeds and stimulates the growth of the garlic. By this method he produced approximately 800 pounds of garlic on a plot 50 feet square.

In order to estimate the number of cloves needed for planting purposes, the purchaser should separate the bulbs and count the average number of cloves in a pound. This divided into the number of plants in a plot will give the amount needed for planting. For example, with garlic running about 150 cloves to the pound, it would take 235 pounds to plant an acre on ridges 30 inches apart, spaced 6 inches between the plants.

#### E. CULTIVATION AND CARE

Shallow cultivation between the ridges should be given by the usual tools available for the purpose, such as side harrows and



SPECIALTY FARM (Cont'd)

spiketooth or disk cultivators. Good drainage must be maintained by keeping the ditches, quarter drains, and furrows clean. Cultivation between the plants and between the rows where several are planted on a ridge is usually done with common hoes, while occasionally wheel hoes are used. When the garlic bulbs begin to form, one should see that the soil is not packed around them or that the bulbs are not planted so deep that it will interfere with their normal expansion.

The method of cultivation used will depend upon the size of the project. Acreages will require the use of horse drawn or motor driven equipment, while small plots will be cultivated by a garden hoe or a wheel type cultivator.

Where the system of ridging the rows is used, a blind person encounters no difficulty in following the rows and avoiding damage to the plants. The contour of the ridge and the normal growth of the garlic makes them easy to follow. The system of planting in beds presents no difficulty to the blind person in cultivating providing the rows are at least 24 inches apart. This allows enough room for him to walk between them without stepping on the plants.

Growers who fertilize heavily with chicken droppings have less difficulty with weeds as they are burned out by the strong manure and the plants are stimulated.

Since the onion thrip seems to be the only pest known at the present time, the use of sprays and insecticides are not often required. However, since the blind person is at a disadvantage in identifying the presence of the thrip insect, the services of the County Agent should be secured intermittently to observe the plants and make recommendations for treatment required in order to prevent them from becoming infested.

As soon as the garlic bulbs are mature, the tops turn yellow and become dry. The blind person can easily identify this condition by feeling the change in the texture of the top knot. Some growers practice breaking off the top knot shortly after it has reached full bloom. In a week or two the plant will begin to dry up and the blind person will know when the bulb is mature by pulling a few samples and pressing to determine their firmness.



SPECIALTY FARM (Cont'd)

## F. INSECTS

Up to the present time it appears that the onion thrip is the only insect affecting garlic that requires any special attention. These minute insects, which frequently do serious injury to onions, attack the leaves by sucking the juices. The burning of garlic refuse is effective in the destruction of any thrips that may be present, but in cases of serious outbreak, consult your County Agent or the workers in your State Agricultural Experiment Station, or write to the United States Department of Agriculture, Washington, D. C. Farmers' Bulletin No. 1371 contains information on the diseases and insects of garden vegetables and can be secured by writing to the United States Department of Agriculture, Washington, D. C.

## G. SPROUTING

A common trouble that may cause serious losses with garlic is what is known as "sprouting." When the bulb sprouts, the sheath binding the stem usually bursts, and a lot of little stems or shoots develop. At harvest such a bulb has a large collection of tops, and the cloves are not usually enclosed in a sheath, making it a very unsatisfactory product. This trouble occurs sporadically, and no satisfactory explanation has been found so far.

## H. HARVESTING

May is the usual month for harvesting garlic in the warmer sections of the south, while in the more northern regions the crop matures in late June or July. As soon as the bulbs are mature, the tops turn yellow and dry up. They are then ready to pull and allow to dry in the field for a few days. The exact time for pulling the garlic can best be determined by pulling up a sample or two. If the outer covering holding the cloves is very strong and hard to break away, it is a little too early. On the other hand, if the garlic is left in the ground too long, the heads will come apart and the cloves will separate from each other making it difficult to harvest.

## I. CLEANING, PLAINTING, CRADING, AND STORAGE

When the bulbs are dry enough to clean and plait they are hauled to large sheds. The cleaning consists of removing the

SPECIALTY FARM (Cont'd)

outer loose portions of the sheath and trimming the roots off close to the bulb with a sharp knife. Such work is usually done by children.

Plaiting garlic is braiding the bulbs by their tops into strings of 50 bulbs each, known as single strings. When two single strings are joined the double string of 100 bulbs is formed. Plaiting is usually done by women at so much per string or thousand bulbs. It requires some practice to plait garlic into the standard strings acceptable to the trade. If beginners cannot readily obtain one experienced in the art of plaiting to teach them, the next best method would be to procure some strings from dealers and learn by separating and replaiting them.

When the bulbs are being trimmed and plaited, they are sorted according to size. It is common practice to make three sizes--large, medium, and small--the respective sizes varying in general according to the run of the lot. Each string should contain bulbs of uniform size and of the same variety. First--class garlic must be clean and white. No bulbs with the outer sheath broken should be included. Sprouted garlic is usually unmerchantable. Occasionally, however, it might be sold to pickle factories that would not be particular about having the cloves enclosed in a neat sheath.

Garlic keeps well in storage if it is plaited and the strings hung up in a dry, well-ventilated, cool place. The bulbs also keep well when stored in the mesh bags, provided the bags are not closely packed or in solid piles. Where garlic is stored in crates, care should be taken that the crates are piled with strips of lath between them to provide plenty of circulation. Failure to provide ventilation and a cool, dry atmosphere will cause the garlic to sprout in storage.

#### J. YIELD

According to information taken from the Department of Agriculture Leaflet No. 138, 4,000 pounds per acre is considered a good yield under average conditions. In localities where the system of plaiting is used, 4,000 pounds would be approximately 250 double strings of 100 bulbs. One grower in the vicinity of St. Louis, Missouri raised approximately 800 pounds in his backyard garden which was less than 50 feet square.

SPECIALTY FARM (Cont'd)

## K. SHIPPING

There seems to be no accepted package for shipping garlic as it is usually sold to the wholesale market by the pound or string. A slatted crate which will permit good ventilation is most desirable. Since garlic is liable to heat if confined, plenty of ventilation must be provided. A standard bushel hamper is suitable for shipping loose garlic.

## L. MARKETING

Garlic is sold most extensively in the New York, Chicago, St. Louis, and San Francisco areas, however, it is sold in large quantities in all cities and in all parts of the countries. There is a wide fluctuation in price depending upon the growing season and the quantity produced in a given area. This price often varies from 30 to 50 cents a pound on the retail market.

Produce houses buy garlic plaited in strings of 50 and 100 bulbs; packed in slatted crates like dry onions, put up in 10 pound mesh bags; and packaged in small cellophane bags containing only a few cloves. The eastern market is more receptive to shipments received in crates. Public markets, grocery stores, and restaurants prefer small lots such as 10 pound mesh bags, crates of 20 to 100 pounds, and cellophane packages containing only a few cloves.

Many growers, especially the smaller ones, sell very little to produce dealers. They deal directly with the retail stores and restaurants, sell from roadside stands, and to individuals who call at their home and buy in small quantities. This method of operating has proven very satisfactory to many of the small growers. It enables them to benefit from better prices, to develop a following of consistent users of garlic, to regulate the quantity to be planted in relationship to the anticipated number of purchasers, and to realize something from the additional work required by catering to a particular class of trade.

## M. COST OF STARTING A PROJECT

No attempt will be made to estimate the cost of land. Real estate values fluctuate and the type of soil cultivated will vary with the different sections of the country. Anyone considering raising garlic as a commercial crop would do well to start on a small scale. Often space is available in the back yard and 2 or



SPECIALTY FARM (Cont'd)

3 truckloads of chicken manure will make it suitable for the purpose.

Example: A plot of ground 50 feet square with the rows 24 inches apart will accomodate 25 rows 50 feet long. If the cloves are planted 6 inches apart in the rows, there will be 100 plants in each row or 2,500 plants in the plot. Bulbs for planting cost from 50 cents to \$1.00 a pound. One pound of sample bulbs should be separated and counted in order to determine the average number of cloves in a pound. If they average 150 cloves to the pound, it will require approximately 17 pounds to plant the plot 50 feet square. Consider the average of 75 cents a pound for planting stock and it will cost \$12.75. Two truck loads of chicken manure at \$5.00 each will cost \$10.00. Tools for hand cultivation, such as a hoe, rake, spade, and mattox will cost approximately \$10.00. The total cost for starting a project 50 feet square will be \$32.75.

REMARKS

Although garlic is sold in all parts of the country and used in limited quantities by most people, the most consistent users are found among the Mediterranean races. This condition would make it easy to flood the local market in many places. Small growers who are not interested in shipping to large distributors of produce, should investigate the type and number of potential users in their area before starting a project.

Small garlic projects, when given proper care, can develop into a profitable enterprise. It may not be practical to grow garlic as the only crop from which to produce a livelihood. However, the type of soil and climate which is suitable for garlic is also suitable for a wide variety of other garden crops and can be combined with many farm pursuits other than gardening. For example, chickens, rabbits, and dairy cattle.

The type of work required in growing and marketing garlic is suitable for complete and successful performance by an able-bodied and industrious individual without sight.

A totally blind staff member of the Branch of Services for the Blind has personally performed the operations of preparing the soil for planting, planting the cloves, weeding and cultivating the growing plants, harvesting, drying, cleaning, sorting, grading, and

SPECIALTY FARM (Cont'd)

crating garlic. He observed the operation of spraying to destroy thrips and it seems most practical to ask for the assistance of the County Agent as suggested in the description.

The Extension Service in each state furnishes technical advice and information on the care and treatment of all types of crops and the County Agent supervises all farm activities in the county.

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JOB SPECIFICATIONS

## TASKS PERFORMED

The operator performs a variety of laboring processes which are involved in preparing land, planting, cultivating, fertilizing, harvesting, and marketing his crop. When preparing land for planting, he works as a laborer spading, pulverizing and raking the soil; stakes out rows by stretching lines; measures distance between rows; and moves stakes as the planting of each row is completed. During the growing period, he cultivates and fertilizes around the plant by use of hand tools such as hoe, rake, shovel and trowel.

SPECIALTY FARM (Cont'd)

During the harvest period, he pulls the plants and leaves them lay on the ground in the field or stacks in flat trays to dry. When dry, he carries them to a work shed where he cleans, plait, grades, sorts, packs, and stores the bulbs.

He markets his crop by making contract with wholesale produce dealers, local restaurants, stores, markets, and individuals.

He keeps simple records of his expenditures and income.

**REQUIREMENTS****PHYSICAL: Age - Active**

Standing and walking most of the time  
Bending and crouching as required in cultivating and harvesting  
Lifting crates weighing up to 50 pounds

**FEET:** Ability to walk, stand, crouch, stoop and push

**HANDS:** The use of both

**THUMBS:** The use of one or both

**FINGERS:** Index, middle and ring finger on both hands

**VISION:** No vision required in the daily work processes

**HEARING:** No hearing required

**MENTAL:** Alertness, good memory, coordination, and ordinary pace

**EDUCATION:** Understanding of the English language. Ability to read and write is important but could be secured or supplied by a member of the family

**PHYSICAL ENVIRONMENT:**

Out-of-doors, at harvest and marketing time works inside of building. Works alone except at harvesting time when help may be required to take care of a heavy yield and facilitate shipping





FEDERAL SECURITY AGENCY  
Office of Vocational Rehabilitation  
Washington 25, D. C.

June 30, 1949

REHABILITATION SERVICE SERIES NUMBER 58 - SUPPLEMENT 6

To : Division of Vocational Rehabilitation (in States with no separate Agency for the Blind); Commissions and Other Agencies for the Blind.

Subject: Supplement to Handbook of Representative Industrial Jobs for Blind Workers - Category GC-11, Photographic Processing.

The attached material on Photographic Processing is to be inserted in the Handbook of Representative Industrial Jobs for Blind Workers as the fourth category in Part II, General Coverage Series. It describes a few of the darkroom processing operations and is not intended to be all inclusive of all possibilities for blind workers. Like the jobs described in previous issues, those in this category have been observed and tested by a blind member of the staff of Services for the Blind Branch.

Other categories of job specifications are being prepared and will be forwarded to you at an early date. Additional copies of the Handbook or any of its supplements will be furnished upon request. We trust that this material will be helpful and would appreciate any suggestions for improvement which you might have to offer.

*Donald H. Dabelstein*

Donald H. Dabelstein,  
ASSISTANT DIRECTOR

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HANDBOOK OF  
REPRESENTATIVE INDUSTRIAL JOBS FOR BLIND WORKERS

GENERAL COVERAGE SERIES

Category GC-11

PHOTOGRAPHIC PROCESSING

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The above list only partially represents the employment opportunities for blind persons in this category and specifications for others will be issued as circumstances permit. Additional jobs such as the following should be sought and all jobs must be carefully analyzed for suitability under the conditions found in a particular plant:

Darkroom Technician (Manual Darkroom - Roll Film)

Film Printer

Negative Loader

Print Drying Belt Feeder

11

THE  
OFFICE OF THE  
SECRETARY OF THE  
NAVY  
WASHINGTON, D. C.  
JANUARY 1, 1900

TO THE  
HONORABLE  
MEMBERS OF THE  
NAVY  
COMMISSION

THE  
NAVY  
COMMISSION  
WASHINGTON, D. C.

REPORT  
ON THE  
NAVY  
COMMISSION  
FOR THE YEAR  
1899

HANDBOOK OF  
REPRESENTATIVE INDUSTRIAL JOBS FOR BLIND WORKERS

GENERAL COVERAGE SERIES

PHOTOGRAPHIC PROCESSING

General Information Sheet

D. O. T. Alternate Titles: (Film Developer (Motion pictures); Film printer (Motion pictures); reproduction machine loader (Motion pictures); photostat operator (any industry); darkroom man (darkroom technician) (any industry); developer I (any industry)).

Description of Job Category: Photographic processing work is primarily conducted in "darkrooms" which are almost totally without illumination when the work is being performed. The category is chiefly concerned with those jobs which entail the handling and manipulating of rolled or cut film in either a dry or wet condition. The work may require the mixing of chemicals as well as the checking and regulating of liquid temperatures. Although machine feeding is included in certain job specifications, the work is performed essentially by hand.

D. O. T. Definition for

- a. Darkroom Man or Darkroom Technician (any industry). Develops photographic negatives; makes prints from negatives; makes enlarged prints from small negatives; works in a completely dark room, which may be lighted by dim, colored lights.
- b. Developer I - (any industry). A Darkroom Man who treats exposed film with chemical solutions in a darkroom to bring out the latent image; mixes chemicals with water usually following rigid formulas and closely regulating temperature of solutions; immerses films, for specified periods of time, in developer solution to make the image visible, in an acidified stop-bath of water and acetic acid to remove developer solution, and in hypo to fix the print.

Characteristics of Usual Worker: Men or women are employed in this type of work; preference is given to young persons who are mentally alert, of an even temperament, and reliable.



## PHOTOGRAPHIC PROCESSING

General Information Sheet (Cont'd)

Physical Requirements, Aptitudes, and Abilities: A considerable amount of movement may be required; therefore, the worker should be able to maintain an accurate sense of direction at all times. Better than average manipulative ability is essential. The worker must be able to stand all day and work rapidly with hands and arms; he must remember the location and stage of development of each film at all times and is generally required to move continually about the work area.

Training and Preparation Procedures: Induction into this work is usually through on-the-job training. Inexperienced applicants may be hired as trainees or helpers and assigned to a darkroom man until they learn how to perform the work efficiently. The time involved in producing competent workers by this means varies according to the ability of the trainee and the adequacy of the training given. The average time involved, however, is approximately six months. Completion of courses offered in vocational and trade schools may shorten the training time for this job. This type of training is particularly advisable for blind persons.

Safety Precautions, Health Conditions, Hazards: Worker is subject to cracking, staining, irritation and possible poisoning of the skin from continual wetting of the hands with the chemical solutions used in developing. This hazard can be substantially reduced by frequent rinsing of the hands in running water.

Industries Where This Category is Frequently Found: The motion picture industry; newspaper and publishing industry; advertising industries; photo developing and finishing establishments in the field of science, engineering, law, education and trades for establishing recorded data, and for making observations and securing more or less quantitative data than would be possible from the use of the naked eye. X-ray darkroom work may be found in hospitals, medical schools and universities, public health organizations, medical departments of industrial establishments, x-ray laboratories serving a group of physicians, dentists or chiropractors in industrial establishments such as foundries, industrial science laboratories, aircraft manufacturers and other concerns where parts are analyzed for the purpose of detecting internal flaws and other internal details.

PHOTOGRAPHIC PROCESSING

General Information Sheet (Cont'd)

Jobs Usually to be Avoided Although Seemingly Suitable: Contact  
printing, film splicing, enlarging, cutting and edging.

Combination Jobs: None

## PHOTOGRAPHIC PROCESSING

DARKROOM TECHNICIAN - X-RAY FILM  
(MANUAL DARKROOM)

1. Name Used for Position in Plant Surveyed: Darkroom Technician

D. O. T. Title: Darkroom man; ref., developer (any industry)

Code: 5-86.510

Alternate Title: Darkroom Technician

D. O. T. Definition: Developer (1) (any industry). A Dark-room Man who treats exposed film with chemical solutions in a darkroom to bring out the latent image; mixes chemicals with water usually following rigid formulas and closely regulating temperature of solutions; immerses films, for specified periods of time, in developer solution to make the image visible, in an acidified spot-bath of water and acetic acid to remove developer solution, and in hypo to fix the print.

Items Worked on in Plant Surveyed: X-ray film

2. Usual Operator:

a. Sex: Male or female

b. General Characteristics: Any size except that extremely short persons might be at a disadvantage because of the requirement of reaching for hangers which are suspended from brackets above the work table; even temperament; young persons preferred; methodical; good judgment; average mental ability.

3. Physical Demands:

a. Activities: Walking, standing, turning, reaching, lifting, carrying, handling, fingering, feeling, hearing.

b. Working Conditions: Inside, wet, odors; adequate ventilation; works alone.

c. Skill Required: Semi-skilled; ability to handle thin flexible sheets of material quickly and to position

LOOK FOR THIS TYPE OF JOB IN THE COURSE OF EACH PLANT SURVEY.



DARKROOM TECHNICIAN - X-RAY FILM (cont'd)  
(MANUAL DARKROOM)

them accurately; remember the location of a number of items and locate any of them quickly; mentally record the various stages of progress when processing a number of different items at the same time; maintain an accurate sense of direction and distance; coordinate the movement of hands and arms; recognize texture, size and contour by touch.

4. Details of Physical Activities: Stands all day; frequently walks up to 15 feet to secure and dispose of materials; reaches at shoulder height up to 4 feet to lift items weighing up to 10 lbs. and places them on work bench in front of him or into developing tanks; fingers, feels, handles, pushes and pulls items weighing up to 2 lbs. to load and unload cassettes and hangers; turns and carries items weighing from a few ounces to 5 lbs. a distance of from 5 to 15 feet; listens for sounds to inform him that pass box is to be unloaded or that film should be transferred to another tank.
5. Details of Working Conditions: Works alone, inside, in adequately ventilated almost totally dark room, wet because of the necessity of transferring film from one chemical solution to another; odors caused by the evaporation of chemical solutions.
6. Hazards: None
7. Sequence of Steps in Position in Plant Surveyed:

Worker:

- a. Removes cassette from incoming side of pass box; places it on work table in front of him and closes the pass box.
- b. Removes identification card from cassette and places it, printing down, in film identifier.
- c. Unlocks cassette by turning lock bar a quarter turn counter-clock-wise.
- d. Opens lid of cassette slightly; removes film by grasping it between thumb and first finger, and closes lid.

LOOK FOR THIS TYPE OF JOB IN THE COURSE OF EACH PLANT SURVEY.

DARKROOM TECHNICIAN - X-RAY FILM (Cont'd)  
(MANUAL DARKROOM)

- e. Places predetermined portion of film in film identifier and "flashes" the film.
- f. Selects proper size hammer from bracket above the work table and fastens one of its clips to each corner of the film, making certain that the film is not buckled.
- g. Places the loaded hanger in developing solution and sets time clock.
- h. Selects proper sized film from storage bin; removes paper covering; opens lid of empty cassette; places the film in cassette, closes it gently, and locks the lid.
- i. Removes card from film identifier and places it along with the loaded cassette in the outgoing side of the pass box.
- j. When time clock rings, removes film from developing tank; washes in stop tank and places in fixing tank.
- k. At the completion of "fixing" time, transfers film to washing tank.
- l. At completion of "washing" time, removes film from washing tank and places it in drier.
- m. When film is dry, removes from drier.
- n. Removes film from hanger and places it at one end of the work table for removal by x-ray technician.
- o. Returns hanger to proper position above work table.

NOTE: Several films may come to the darkroom technician at one time, making it necessary for him to keep the developing tank loaded to capacity, in which case care must be taken that the films do not come in contact with each other while they are in the developing and fixing baths.

In order to avoid crimping or crinkling, dry film should be handled by suspending it between the thumb and forefinger, with the hand uppermost. In handling film, grasp it as near to the edge as possible.

LOOK FOR THIS TYPE OF JOB IN THE COURSE OF EACH PLANT SURVEY.

DARKROOM TECHNICIAN - X-RAY FILM (cont'd)  
(MANUAL DARKROOM)

them accurately; remember the location of a number of items and locate any of them quickly; mentally record the various stages of progress when processing a number of different items at the same time; maintain an accurate sense of direction and distance; coordinate the movement of hands and arms; recognize texture, size and contour by touch.

4. Details of Physical Activities: Stands all day; frequently walks up to 15 feet to secure and dispose of materials; reaches at shoulder height up to 4 feet to lift items weighing up to 10 lbs. and places them on work bench in front of him or into developing tanks; fingers, feels, handles, pushes and pulls items weighing up to 2 lbs. to load and unload cassettes and hangers; turns and carries items weighing from a few ounces to 5 lbs. a distance of from 5 to 15 feet; listens for sounds to inform him that pass box is to be unloaded or that film should be transferred to another tank.
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6. Hazards: None
7. Sequence of Steps in Position in Plant Surveyed:

Worker:

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- b. Removes identification card from cassette and places it, printing down, in film identifier.
- c. Unlocks cassette by turning lock bar a quarter turn counter-clock-wise.
- d. Opens lid of cassette slightly; removes film by grasping it between thumb and first finger, and closes lid.

LOOK FOR THIS TYPE OF JOB IN THE COURSE OF EACH PLANT SURVEY.



DARKROOM TECHNICIAN - X-RAY FILM (Cont'd)  
(MANUAL DARKROOM)

- e. Places predetermined portion of film in film identifier and "flashes" the film.
- f. Selects proper size hammer from bracket above the work table and fastens one of its clips to each corner of the film, making certain that the film is not buckled.
- g. Places the loaded hanger in developing solution and sets time clock.
- h. Selects proper sized film from storage bin; removes paper covering; opens lid of empty cassette; places the film in cassette, closes it gently, and locks the lid.
- i. Removes card from film identifier and places it along with the loaded cassette in the outgoing side of the pass box.
- j. When time clock rings, removes film from developing tank; washes in stop tank and places in fixing tank.
- k. At the completion of "fixing" time, transfers film to washing tank.
- l. At completion of "washing" time, removes film from washing tank and places it in drier.
- m. When film is dry, removes from drier.
- n. Removes film from hanger and places it at one end of the work table for removal by x-ray technician.
- o. Returns hanger to proper position above work table.

NOTE: Several films may come to the darkroom technician at one time, making it necessary for him to keep the developing tank loaded to capacity, in which case care must be taken that the films do not come in contact with each other while they are in the developing and fixing baths.

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LOOK FOR THIS TYPE OF JOB IN THE COURSE OF EACH PLANT SURVEY.

DARKROOM TECHNICIAN - X-RAY FILM (Cont'd)  
(MANUAL DARKROOM)

8. Equipment as Found in the Particular Plant Surveyed:

- a. Identification: Work table, cassettes, hangers, liquid thermometer with Brailled dial; Chamberlain Film Identifier; developing and fixing tanks; open-faced time clock; Eastman Film Drier.
- b. Set-up and Maintenance: Worker must take temperatures and adjust mixing valves in order to maintain proper temperatures in the developing tanks; he may also be required to mix his own developing and fixing solutions, clean the tanks and keep darkroom in order.
- c. Modification: An open-faced clock should be used in order that a blind person may set his own clock; small strips of adhesive tape can be placed at each half minute marking. The American Foundation for the Blind supplies a Braille thermometer which can be read accurately by touch.

9. Equipment Variations Which May be Found in Other Plants:

Substantially the same in all darkrooms. If a film identifier is not used, the identification markings are usually photographed at the same time the original x-ray picture is taken.

10. Usual Pre-employment Training: Two to four weeks training in darkroom work is usually given to persons employed in this field.
11. Usual Training Procedure on the Job: The chief x-ray technician closely supervises the work of a new employee and gradually tapers off supervision as the worker's knowledge and skill increase.
12. Any Training Deviations Suggested for the Blind: A blind person should know the on and off position of each switch controlling the lights in the darkroom in which he is working and be solely responsible for operating them. Prior to placement he should have a thorough knowledge of all phases of darkroom procedure. One source of training is the Mallinckrodt Institute of Radiology, St. Louis, Missouri, where arrange-

LOOK FOR THIS TYPE OF JOB IN THE COURSE OF EACH PLANT SURVEY.

DARKROOM TECHNICIAN - X-RAY FILM (Cont'd)  
(MANUAL DARKROOM)

ments for four weeks' training at a cost of \$50, exclusive of transportation and maintenance can be made with Mr. Wilbur Walch, Chief x-ray technician.

13. Production:

- a. Full: 150 to 200 films per day
- b. Time to Reach Normal Efficiency: If previously trained, two to four weeks.

14. Interrelation with Preceding and Succeeding Jobs: Cassettes must be removed from the incoming side of the pass box, emptied, reloaded, and placed in the outgoing side of the pass box as quickly as possible in order that the x-ray technician may have a complete supply at all times.

15. Teaming with Other Workers: Occasionally two darkroom technicians will work together, one being responsible for unloading cassettes, hanging films, and reloading cassettes, and the other responsible for processing the films through the fixing, developing and washing tanks.

16. Modification, Deviation, Special Tools for the Blind: A blind worker should have a Brailled liquid thermometer, in order that he may regulate the temperature in the developing and fixing tanks. An open-faced time clock can easily be read by a blind person if small strips of adhesive tape or other raised identifications are placed at the half-minute markings.

17. Sight Requirements and Conditions:

- a. Vision Required for the Job: None
- b. Conditions affecting Suitability of a Particular Job:
  - 1. For the Totally Blind: There should be no requirement for reading instruction cards or writing information on the film.
  - 2. For the Partially Sighted: Because of the fact that "safe" light is the only illumination in a darkroom, there should be no requirement for reading instructions or writing information on the film.

LOOK FOR THIS TYPE OF JOB IN THE COURSE OF EACH PLANT SURVEY.



DARKROOM TECHNICIAN - X-RAY FILM (Cont'd)  
(MANUAL DARKROOM)

18. Avoid the Following Conditions: Necessity to write case numbers and identifying information on film; the use of a closed-face time clock.
19. Other Jobs Often Combined for Full Time Employment: None
20. Industries, Parts of Industries or Types of Plants Where This Type of Job is Frequently Found:

X-ray departments of general hospitals with 250 beds or more and with an out-patient department; veterans' hospitals with 300 beds or more; large tuberculosis sanatoria; radiology departments of medical schools; x-ray centers serving a group of chiropractors; x-ray centers serving a group of surgeons and medical doctors; industrial plants; arsenals and large engineering projects where castings, moldings, foundations or any solid objects are subject to x-ray tests.

LOOK FOR THIS TYPE OF JOB IN THE COURSE OF EACH PLANT SURVEY.

## PHOTOGRAPHIC PROCESSING

PACO MACHINE OPERATOR - X-RAY FILM

1. Name Used for Position in Plant Surveyed: Paco Darkroom Technician.

D. O. T. Title: Paco Machine Operator (any industry)

Code: 9-86.38

Alternate Titles: None

D. O. T. Definition: Not compiled

Items Worked on in Plant Surveyed: X-ray film

2. Usual Operator:

a. Sex: Male or female

b. General Characteristics: Any size; even temperament; young persons preferred; methodical; average mental ability.

3. Physical Demands:

a. Activities: Walking, standing, turning, reaching, lifting, carrying, pushing, pulling, handling, feeling, hearing.

b. Working Conditions: Inside; odors; adequate ventilation; works alone.

c. Skill Required: Semi-skilled; ability to handle thin flexible sheets of material quickly and to position them accurately; remember the location of a number of items and locate them quickly; maintain an accurate sense of direction and distance; coordinate the movement of hands and arms; recognize size and contour by touch.

4. Details of Physical Activities: Stands all day; frequently walks up to 15 feet to secure and dispose of materials; reaches at shoulder height up to 4 feet to lift items weighing up to 10 pounds, and places them on work bench in front of him, or into magazine of Paco machine. Pushes levers to secure films to hangettes to load the

LOOK FOR THIS TYPE OF JOB IN THE COURSE OF EACH PLANT SURVEY.

## PHOTOGRAPHIC PROCESSING

PACO MACHINE OPERATOR - X-RAY FILM (Cont'd)

magazine of the Paco machine; turns and carries items weighing from a few ounces to 5 pounds a distance of from 5 to 15 feet; fingers, feels, handles, pushes and pulls items weighing up to 2 pounds to load and unload cassettes and hangettes; listens for sounds to inform him that pass box is to be unloaded.

5. Details of Working Conditions: Works alone, inside, in adequately ventilated, almost totally dark room; odors caused by the evaporation of chemical solutions.

6. Hazards: None

7. Sequence of Steps in Position in Plant Surveyed:

Worker:

- a. Removes cassette from incoming side of pass box, places it on table in front of him and closes the pass box.
- b. Removes identification card from cassette and places it, printing down, in film identifier.
- c. Unlocks cassette by turning lock bar a quarter turn counter-clock-wise.
- d. Opens lid of cassette slightly, removes film by grasping it between the thumb and first finger, and closes lid.
- e. Places predetermined portion of film in film identifier and "flashes" the film.
- f. Selects proper size hangette from bracket beneath the work table and places it in the loading machine, making sure that each of the 4 pin holders fit into the proper notches in the frame of the loading machine.
- g. Removes film from identifier and places it between the film guides of the loading machine.
- h. Attaches film to hangette by pressing handle of film loading machine as far down as it will go.

LOOK FOR THIS TYPE OF JOB IN THE COURSE OF EACH PLANT SURVEY.



## PHOTOGRAPHIC PROCESSING

PACO MACHINE OPERATOR - X-RAY FILM (Cont'd)

- i. Removes loaded hangettes from loading machine and after taking the identifying card from the film identifier places it in the clip on top of the hangette.
- j. Stacks loaded hangettes on work bench against the wall until several have accumulated.
- k. Selects proper size film from storage bin, removes paper covering, opens lid of empty cassette, places the film in cassette, closes it gently and locks the lid.
- l. Places loaded cassette in the outgoing side of the pass box.
- m. Picks up several hangettes and suspends them from the loading bars of the Paco machine.
- n. Pulls lever to advance hangettes to the magazine of the Paco machine, from which point they are processed automatically and delivered dry to the x-ray technician outside the darkroom.

NOTE: In order to avoid crimping or crinkling, dry film should be handled by suspending it between the thumb and forefinger, with the hand uppermost. In handling the film, grasp it as near to the edge as possible.

Several cassettes may come to the darkroom technician at one time, in which case he usually completes the handling of the film before reloading the cassette.

8. Equipment as Found in the Particular Plant Surveyed:

- a. Identification: Work table, cassettes, hangettes, Chamberlain film identifier, Paco developing machine.
- b. Set-up and Maintenance: The worker is expected to set the controls of the Paco machine. They consist of:  
2 electric switches - one controlling the drying mechanism, the other controlling the mechanism which moves the film from tank to tank;  
2 timing control levers - one for half minutes and another for full minutes. These levers are so constructed that their points fit into holes at each marked graduation, making it possible for a blind person to set them without assistance.

LOOK FOR THIS TYPE OF JOB IN THE COURSE OF EACH PLANT SURVEY

## PHOTOGRAPHIC PROCESSING

PACO MACHINE OPERATOR - X-RAY FILM (Cont'd)

The worker may also be required to mix his developing and fixing solutions. This can be done by a blind person if he uses ready mixed packages of developing and fixing chemicals.

c. Modification: None

9. Equipment Variations Which May be Found in Other Plants:

Essentially the same in all darkrooms. If a film identifier is not used the identification markings are usually photographed at the same time the original picture is taken.

10. Usual Pre-employment Training: Induction into this work is usually through on-the-job training.

11. Usual Training Procedure on the Job: The chief x-ray technician closely supervises the work of a new employee and gradually tapers off supervision as the worker's knowledge and skill increase.

12. Any Training Deviations Suggested for the Blind: A blind person should know the on and off positions of each switch controlling the lights in the darkroom in which he is working and be solely responsible for operating them. Prior to placement he should have a thorough working knowledge of all phases of darkroom procedure. One source of training is the Mallinckrodt Institute of Radiology, St. Louis, Missouri, where arrangements for four weeks' training at a cost of \$50, exclusive of transportation and maintenance can be made with Mr. Wilbur Walch, Chief x-ray technician.

13. Production:

a. Full: 300 to 400 films per day

b. Time to Reach Normal Efficiency: Two weeks, if trained for this type of work.

14. Interrelation with Preceding and Succeeding Jobs: Cassette must be removed from the incoming side of the pass box, emptied, reloaded and placed in the outgoing side of the pass box as quickly as possible in order that the x-ray technician may have a complete supply at all times.

LOOK FOR THIS TYPE OF JOB IN THE COURSE OF EACH PLANT SURVEY.

## PHOTOGRAPHIC PROCESSING

PACO MACHINE OPERATOR - X-RAY FILM (Cont'd)

15. Teaming with Other Workers: None
16. Modification, Deviation, Special Tools for the Blind: None
17. Sight Requirements and Conditions:
  - a. Vision Required for the Job: None
  - b. Conditions affecting Suitability of a Particular Job:
    1. For the Totally Blind: None
    2. For the Partially Sighted: None
18. Avoid the Following Conditions: Necessity to write case numbers and identifying information on film.
19. Other Jobs Often Combined for Full Time Employment: None
20. Industries, Parts of Industries or Types of Plants Where This Type of Job is Frequently Found:

X-ray department of general hospitals with 250 beds or more and with an out-patient department; veterans' hospitals with 300 beds or more; large tuberculosis sanatoria; radiology departments of medical schools; x-ray centers serving a group of chiropractors; x-ray centers serving a group of surgeons and medical doctors; industrial plants; arsenals and large engineering projects where castings, molding, foundations or any solid objects are subject to x-ray tests.

LOOK FOR THIS TYPE OF JOB IN THE COURSE OF EACH PLANT SURVEY.



## PHOTOGRAPHIC PROCESSING

PACO MACHINE OPERATOR - ROLL FILM

1. Name Used for Position in Plant Surveyed: Paco Machine Operator  
D. O. T. Title: Paco Machine Operator (any industry)  
Code: 9-86.38  
Alternate Titles: None  
D. O. T. Definition: Not compiled  
Items Worked on in Plant Surveyed: Roll Film
2. Usual Operator:
  - a. Sex: Male
  - b. General Characteristics: Any size, even temperament, steady, young persons preferred, methodical, average mental ability.
3. Physical Demands:
  - a. Activities: Walking, standing, turning, reaching, lifting, carrying, pushing, pulling, handling, fingering, hearing.
  - b. Working Conditions: Inside, odors, adequate ventilation, works alone.
  - c. Skill Required: Semi-skilled; ability to handle thin flexible strips of material quickly and to position them accurately; remember the location of a number of items and locate them quickly; maintain an accurate sense of direction and distance; coordinate the movement of hands and arms.
4. Details of Physical Activities: Stands all day; frequently walks a distance varying from 2 ft. to 15 ft. to secure material; continually turns, reaches and lifts items weighing approximately 3 lbs. from waist to shoulder height; occasionally carries boxes of material weighing up to 15 lbs. a distance varying from 5 ft. to 15 ft; handles, pushes, pulls, fingers and feels strips of film,

LOOK FOR THIS TYPE OF JOB IN THE COURSE OF EACH PLANT SURVEY.

## PHOTOGRAPHIC PROCESSING

PACO MACHINE OPERATOR - ROLL FILM (Cont'd)

clips and film hangers to place the film in the proper position for developing. From time to time listens to and talks with others to receive instructions and discuss operational procedure.

5. Details of Working Conditions: Works alone, inside, in adequately ventilated, almost totally dark room, unpleasant odor because of the evaporation of chemicals.
6. Hazards: None
7. Sequence of Steps in Position in Plant Surveyed:

Worker:

- a. Takes a loaded film hanger from the dolly which has been placed at his side by another worker and places each end in a notch of the loading brackets with the envelope facing away from him. (The film hanger is a stick approximately 22 inches long, to which are affixed five, 3-part clips - one upper for holding identifying envelopes and two lower for film).
- b. Starting at one end of the stick, removes the roll of film from the roll clip and unwinds the paper until the free end of the film is reached.
- c. Drops the spool and paper and inserts the end of the film in the lower portion of the clip.
- d. With his finger follows the edge of the film to the other end, tears the paper away and drops it and the spool into the waste can at his side.
- e. Takes a weighted clip from a convenient tray and attaches it to the end of the film.
- f. Repeats this procedure with each of the remaining rolls.
- g. Grasping the ends of the hanger with both hands, picks it out of the notches of the loading brackets, moves it forward about a foot, and sets it into a pair of notches on the feed chains just under or preceding the positioning bars. (If this position is already filled, the holder is placed in the next open position).

LOOK FOR THIS TYPE OF JOB IN THE COURSE OF EACH PLANT SURVEY.

## PHOTOGRAPHIC PROCESSING

PACO MACHINE OPERATOR - ROLL FILM (Cont'd)

## 7. (Cont'd)

NOTE: Film should always be grasped at the extreme edge and care should be taken not to allow it to slip out of the fingers and re-roll itself.

8. Equipment as Found in the Particular Plant Surveyed:

a. Identification: Paco developing machine (large size); film hangers; dollies; weighted clips; clip tray; trash can; sink with running water; five gallon mixing buckets and mixing paddles; liquid thermometer.

b. Set-up and Maintenance:

1. The operator is required to check the temperature of the developing solution twice a day or at the beginning of each run of film.
2. The rate of progress of the film through the chemical baths may be adjusted when necessary by setting the belt onto the proper step of the motor pulley. The temperature and/or the age of the developer will determine on which step of the pulley the belt is to be placed. It is essential that a blind operator check on the appearance of the film periodically with a sighted person in order to ascertain that the developing time is correct for the condition of the developing solution.
3. It is necessary to switch on the drying equipment before each run and switch it off after the run is completed.
4. Whenever the level of the developing or other solutions is an inch below the full line, the tank must be replenished. The operator is required to mix his own solutions, using water and standard single batch packages of chemicals.

c. Modification: See Item No. 16 for explanation of Braille thermometer.

9. Equipment Variations Which May be Found in Other Plants:

Essentially the same in all plants although in a few instances

LOOK FOR THIS TYPE OF JOB IN THE COURSE OF EACH PLANT SURVEY.



## PHOTOGRAPHIC PROCESSING

PACO MACHINE OPERATOR - ROLL FILM (Cont'd)

minor variations will be found where an owner desires to modify the Paco equipment or to design and complete his own.

10. Usual Pre-employment Training: None
11. Usual Training Procedure on the Job: An experienced worker or foreman instructs the new worker in all steps of the job and tapers off his instruction and supervision as the workers knowledge and skill increase.
12. Any Training Deviations Suggested for the Blind:
  - a. A blind person must be taught to read the Braille thermometer accurately before being placed on the job.
  - b. Before being taught the routine of processing films, the worker should know the lay-out of the darkroom, all the parts of the machine and their action, the location and on-and-off positions of all switches, the storage location and method of identifying packages of chemicals, and the location of such items as mixing buckets, paddles and towels.
  - c. The operator should be taught to check the light switches every time he enters the darkroom.
13. Production:
  - a. Full: 250 to 300 per hour  
125 to 150 on the junior machine
  - b. Time to Reach Normal Efficiency: One month
14. Interrelation with Preceding and Succeeding Jobs: The output of the plant depends largely upon the operator's ability to keep the feed chains filled at all times. Interruptions in the operation of the machine have no material effect upon the preceding operations.
15. Teaming with Other Workers: None

LOOK FOR THIS TYPE OF JOB IN THE COURSE OF EACH PLANT SURVEY.

## PHOTOGRAPHIC PROCESSING

PACO MACHINE OPERATOR - ROLL FILM (Cont'd)16. Modification, Deviation, Special Tools for the Blind:

A Braille liquid thermometer may be obtained from the American Foundation for the Blind, 15 West 16th Street, New York, N. Y. This thermometer can be read accurately by touch.

17. Sight Requirements and Conditions:

a. Vision Required for the Job: None

b. Conditions affecting Suitability of a Particular Job:

1. For the Totally Blind: None

2. For the Partially Sighted: None

18. Avoid the Following Conditions: Additional duties which cannot be performed without the use of sight.

19. Other Jobs Often Combined for Full Time Employment: None

20. Industries, Parts of Industries or Types of Plants Where This Type of Job is Frequently Found:

Developing and printing laboratories; developing departments of Chain Drug Stores and photographic supply companies.

LOOK FOR THIS TYPE OF JOB IN THE COURSE OF EACH PLANT SURVEY.





DEPARTMENT OF  
HEALTH, EDUCATION, AND WELFARE  
Office of Vocational Rehabilitation  
Washington 25, D.C.

June 30, 1954

REHABILITATION SERVICE SERIES NUMBER 52 - SUPPLEMENT 7

TO: Divisions of Vocational Rehabilitation; Commissions and other  
Agencies for the Blind

SUBJECT: Job Description, "Raising Turkeys in Confinement and on the Range,"  
Handbook of Job Descriptions in Rural Activities Suitable for the  
Employment of Blind Persons

The attached job description of a Specialty Farm for Raising Turkeys, USES Code 3-08.10, should be inserted in PART II-B as JOB NO. 9 of the Handbook of Job Descriptions in Rural Activities Suitable for the Employment of Blind Persons.

The job description is written in two chapters, each of which is a separate and distinct project; namely, Chapter I--Raising Turkeys in Confinement (off the ground), and Chapter II--Raising Turkeys on the Range. Since the history of the industry and the methods of acquiring stock are the same, regardless of the system used, these sections appear only at the beginning of the job description. For the same reason, the bibliography appears only at the end of the description.

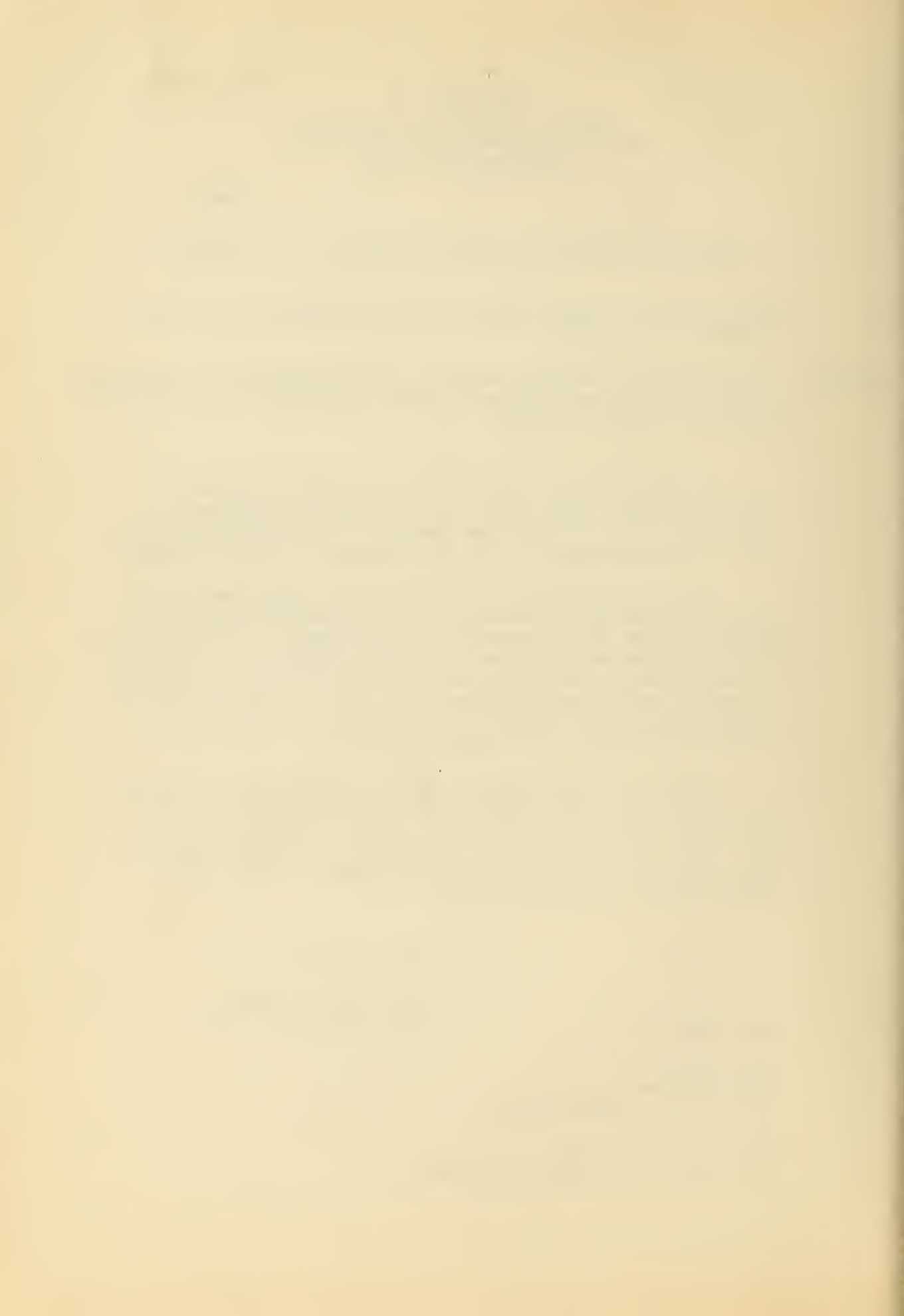
The job, as described in Chapter I--Raising Turkeys in Confinement, like those already in the Handbook, has been observed and tested by a blind staff member in Services for the Blind. The job, as described in Chapter II--Raising Turkeys on the Range, has been observed and analyzed by a blind staff member of Services for the Blind.

*M. I. Tynan*

M. I. Tynan, Chief  
Services for the Blind

Attachment

DISTRIBUTION  
Direct Mailing  
Directors or Supervisors  
Redistribution  
District Supervisors  
All Counselors Serving the Blind



SPECIALTY FARM

RAISING TURKEYS

TURKEY RAISER - USES CODE 3-08.10

There are two species of turkeys now living in the world. One is the beautiful ocellated or Yucatan turkey, *Agriocharis ocellata*, which rivals the peacock in brilliance of plumage. It inhabits the tropical forests of southern Mexico and Central America and, so far as can be determined, never has been domesticated. The other species is the North American wild turkey. It once abounded in New England and along the northern Atlantic seaboard. It is from this species that the turkey of today, having been domesticated by the Indians long before the discovery of America, is supposed to have been derived. From this, five subspecies are recognized: (1) the Eastern turkey which was formerly found from the Gulf Coast to Maine. This subspecies has been exterminated in New York and New England; (2) the Florida turkey which is found today in the southern two-thirds of the Florida peninsula; (3) the Rio Grande wild turkey which ranged over southern Texas and northwestern Mexico; (4) Merriam's turkey, which inhabited Arizona, New Mexico, southern Colorado, western Texas, and northwestern Mexico; and (5) the Mexican wild turkey, which ranged over central Mexico and is still in existence.

In their wild state, turkeys inhabit chiefly deep woods, borders of swamplands, and the banks of streams. At one time they were abundant in many places, and early writers tell of their custom of gathering in flocks of hundreds and migrating on foot for long distances in quest of food.

When laying time approaches, the hens steal away and make their nests in the grass or bushes in some open space in the woods, or brush grown fields. They lay 12 creamy white and somewhat speckled eggs in nests, which they hide with great care, not only to avoid foxes and other predatory animals, but to prevent detection by the gobbler. It is unanimously believed that he will break the eggs if he comes upon them.

In domestication, turkeys are quite difficult to raise as they require wide range and protection from dampness and disease. When these conditions are met and growers make use of adequate facilities, modern equipment, and technical information available to farmers, the raising of turkeys is an important and profitable occupation.

The important areas of production now are the Middle West, the Pacific Coast, and the Middle Atlantic States, where large numbers of small and medium-sized turkeys are raised on farms and ranches. Up to 60,000 turkeys have been raised on one farm in a season. Usually, however, when turkeys feed on the range, not more than 5,000 are reared in one



### Raising Turkeys (Contd.)

flock, and flocks of 1,500 to 2,500 are popular sizes for commercial enterprises. When raised in confinement (off the ground--on wire, slats, or pebbles), smaller flocks (100 to 1,000) are popular sizes and can be raised profitably.

With new and scientific developments on the breeding and care of turkeys, plus the increasing national demand for turkey meat, the industry has extended to all parts of the country.

According to the census, there were 10,754,060 turkeys in the United States on June 1, 1890, and 6,594,695 on June 1, 1900. Although for the ensuing 30 years there was a general decline in the industry, the Bureau of Agricultural Economics estimated that 18,476,000 turkeys were raised in 1929; and that by 1951, the number of turkeys was 52,261,000, with an estimated 58,800,000 for 1952.

The gross income for turkeys in the United States reached \$272,759,000 in 1949. This was approximately 8 percent of the value of all poultry products combined. In 1951, which was the record year, the gross income from the sale of turkeys reached \$343,772,000.

With the development of a smaller variety or breed of turkey which more nearly meets the needs of the average family, and the modern facilities for storing large quantities of frozen foods, the annual consumption of turkey meat continues to increase.

#### I. ACQUIRING STOCK

Stock can be obtained by (a) owning a breeding flock and producing eggs and poults; (b) buying eggs and having them hatched under turkey hens, in incubators, or by commercial hatcheries; and (c) buying day-old poults from hatcheries. Poults to be marketed as broilers and small roasters should be started in February and early March. Turkeys for the Thanksgiving and Christmas markets should be started in June and July.

All eggs or poults should be from well-bred flocks, free from pullorum and other diseases. When turkeys beyond the day-old stage are purchased, the disease history of the flock should be investigated and the stock should be examined for lice upon arrival. Poults should be quarantined for 2 or 3 weeks to detect any possible disease or internal parasites.

Information regarding reliable sources from which to purchase hatching eggs, poults, or young turkeys may be obtained by communicating with the following agencies and organizations:

Raising Turkeys (Contd.)

The American Poultry Association, Davenport, Iowa, has for its primary function the standardizing of varieties of poultry in North America. The Association publishes the "American Standard of Perfection" which contains concise descriptions of breeds and varieties of poultry;

The National Turkey Improvement Plan, now in operation in most States, provides for official supervision of breeding flocks and small-type turkeys; thus assuring adequate control for the quality of turkeys produced commercially. Authority for the administration of the Plan is contained in the Department of Agriculture Organic Act of 1944. The Plan is administered in each State by an official State agency cooperating with the Bureau of Animal Industry, United States Department of Agriculture. The primary objectives of the National Turkey Improvement Plan are to improve the production and market quality of turkeys and to reduce losses from disease. Through it, turkey breeding stock, hatching eggs, and poults may be identified, authoritatively, with respect to breeding quality and degree of freedom from pullorum disease. The official State agency recognized by the Bureau of Animal Industry, to cooperate in administering the Plan within a State, may be the State Department of Agriculture, State College of Agriculture, or other agency recognized officially by the State government; and

Extensive research has been conducted on the United States Experiment Farms at Beltsville, Maryland, and at many State universities and colleges. Persons desiring to purchase hatching eggs or day-old poults for the purpose of raising turkeys should consult the local county agricultural agent for advice, and write to the United States Department of Agriculture and the Departments of Agriculture in their States concerning certified dealers and hatcheries from which to purchase the breeding strains of turkeys which are most suitable for the type of project to be conducted.

SPECIALTY FARM  
RAISING TURKEYS

CHAPTER I - RAISING TURKEYS IN CONFINEMENT (OFF THE GROUND)

II. OPERATIONS INVOLVED AND FACTORS TO BE CONSIDERED

The following information was secured from a personal observation, analysis, and performance of the operations involved in the raising of turkeys on the farm of Steve Alsaesar, a totally blind man of Cincinnati, Ohio; from a comprehensive study of bulletins, books, and journals published by the United States Bureau of Animal Industry; from books written by authorities on turkey raising; and from two county agricultural agents.

A. Advantages and Disadvantages of the System

The chief advantages are:

1. That only a small area of land is needed, and the turkeys are concentrated under the direct control of the operator. (This latter fact is of extreme importance to persons with little or no sight. It eliminates the necessity of extensive travel, and enables them to perform a larger percentage of the work than would be possible when caring for turkeys raised on the open range. In fact, some totally blind persons perform all the tasks involved without sighted assistance; also they can do much of their own carpentry work, such as remodeling buildings and constructing equipment);
2. The small amount of space required for raising turkeys in confinement makes it possible for many persons, with little capital and a small plot of land of inferior quality, to get a start;
3. There is less likelihood of losses from predatory animals, thieves, parasites, and soil-borne diseases such as blackhead; and
4. Turkeys are well protected from the weather.

The chief disadvantages, as compared with raising on the range, are:

1. Higher cost for feed and equipment;



Raising Turkeys in Confinement (Contd.)

2. More trouble from breast blisters, feather picking, and foot and hock deformities; and
3. More difficulty in supplying a well-balanced diet.

B. Points Necessary for Success in Raising Turkeys

1. Try to locate near a good market. This may be near a village, a town, or city, and should always be accessible to buyers of live turkeys.
2. Since turkey production requires a high investment per bird, make careful inquiries as to the different types and sources of loans available for financing the production phases and marketing operations.
3. Before building any production or marketing facilities, make a decision as to whether turkeys will be sold alive only, or whether an investment in processing equipment would be wise.
4. Determine the kinds and classes of turkeys wanted by buyers of both live and processed turkeys.
5. If processing is to be done, try to locate on a busy highway.
6. If the annual volume is as large as 2,000 birds, consider the use of a picking machine.
7. Become acquainted with existing Federal, State, and municipal regulations which pertain to processing, transporting, selling, and other applicable operations.
8. Discuss all plans in detail with the county agricultural agent and turkey marketing specialists in the State college of agriculture. Avail yourself of the benefit of their experience.

C. Locality

In general, it may be said that turkeys are grown successfully in practically every part of the country, as they stand both heat and cold and high and low altitudes, provided they are given adequate seasonal shelter from winter weather, dampness, and summer heat.

Turkey projects are being conducted in small towns, in the vicinity of large cities, in remote rural areas; on general farms, on large farms, and on ranches where flocks of from 5,000 to 60,000 are grown.

### Raising Turkeys in Confinement (Contd.)

The important areas of production now are the Middlewest, the Pacific Coast, and the Middle Atlantic States, where turkeys are raised for the most part on the open range.

Raising turkeys in confinement (off the ground—on wire, slats, or pebbles) is practiced to a large extent in the extreme East and the New England States. However, the system is increasing in popularity and is extending to all parts of the country.

#### D. Housing

There are many different styles and types of housing that turkey growers have found to be convenient and adequate for their use. Anyone contemplating going into the business, should consult the county agricultural agent for advice regarding appropriate housing for that particular area. He should also write the poultry division of the Agricultural College in his State, and the Bureau of Animal Industry, U.S. Department of Agriculture, Beltsville, Maryland, for information and drawings to use as a guide in planning the purchase or construction of housing.

Frequently, there is unused space in a barn, garage, or other out building that may be remodeled for storing feed or brooding poults; therefore, eliminating the cost of erecting new and expensive quarters. Regardless of the building utilized or the space occupied, the feed supply, brooders, and rearing pens should be arranged in such a manner as to eliminate unnecessary travel and retracing of steps in the process of the daily work.

Feed should be stored where it is dry and protected from contamination by rats and other rodents, because molded feed causes many illnesses among turkeys and all rodents are carriers of disease. The storage space required will depend upon the availability of the feed and frequency of delivery. A small storage space of approximately 100 square feet is a convenient size for most projects.

#### 1. Brooder Houses

The following information was taken from "Turkey Management" by S. J. Marsden and J. H. Martin.

Elaborate housing is not required anywhere in the United States for successful turkey management. During the brooding period when birds are raised artificially, all that is needed is a brooder house which can be heated to a floor temperature of about 70° F.

Raising Turkeys in Confinement (Contd.)

In warm climates the construction may be cheaper than in cold climates. Turkeys brooded in advance of the normal season may require better housing than those brooded in the normal spring season. The general principles of brooder house construction for all kinds of poultry may be applied to turkey brooder houses. A warm dry floor, ample light, sufficient ventilation, protection from vermin, tight walls, and a roof that will retain the heat and protect against the weather, are the requirements. Interior fixtures required are: Brooder, roosts, water fountains, feeders, wire-covered platforms for feeders and waterers, and litter or wire floors.

Portable brooder houses are constructed of wood or composition board and placed on skids. If use in sub-freezing temperature is contemplated, the floors should be double-boarded with building or tar paper between the layers. The walls are usually single boarded with tight-fitting material. The roof is commonly made of boards and composition roofing, or less frequently, of metal or plywood. A house 10' by 12' or 9' by 14' is satisfactory in size. Brooder houses much larger cannot be moved readily and houses much smaller are not economical. These sizes will carry about 180 poults for the first 8 weeks.

## 2. Confinement Quarters

The following information on confinement quarters and materials was taken from Farmers' Bulletin No. 1409, U.S. Department of Agriculture:

For large-type turkeys the entire confinement quarters should supply about 7 square feet of floor space per tom and about 5 per hen, or an average of about 6 for both sexes raised to market age. Medium-sized varieties should have about  $5\frac{1}{2}$  square feet; and small-type turkeys about 5 square feet per bird in mixed flocks. On this basis, a platform 20' x 35' containing a roofed-over section 16' x 20' will provide rearing quarters for about 100 male large-type turkeys, or 140 hens, or 115 of both sexes. However, many growers are successful when only about 4 square feet of floor space is provided per bird.

Necessary equipment consists of a shelter attached to or made part of a rearing platform, with feeders, waterers, and roosts. Rearing platforms should be built up off the ground at least 4', and preferably, 6' to 8' to allow



Raising Turkeys in Confinement (Contd.)

space underneath for cleaning. Ground with a fairly steep slope frequently is chosen, as the building can then be firmly anchored close to or on the ground on the one side; and the slope permits easy cleaning, natural air, and water drainage.

Supports for the shelter may be made of concrete or treated wooden piling, topped with a floor framework of rough-sawed, 2- by 6-inch material for the outer edges, and 1- by 6-inch lumber placed 2 feet apart for the inside framework. Another method is to use planed 2-by-6's, set parallel 24 inches apart, resting on braced 3- by 8-inch girders. The 2-by-6's support the floor wire or slatted flooring material with a minimum of cross supports. Beveling the top edges a little to present a top surface of three-fourths inch is a help in sanitation, but is not essential. Beveling to a sharp edge is undesirable. Growers, living in wooded areas, may use poles and saplings; therefore, eliminating purchasing expensive milled lumber.

### 3. Floor Materials

The kinds of materials best suited for floors are:

- a. One-inch square clear fir, cypress, or oak slats placed one inch apart;
- b. One-by four-inch mesh electric weld, galvanized; 11-gage wire laid smoothly and the joined strips laced at the selvage with 12- to 14-gage plain galvanized wire, or with hog rings placed at close intervals. The wire should be nailed or stapled with poultry-wire staples at least 1 inch long to the outer edges of the platform, but not to the center supports, since this tends to break the wire.
- c. Other satisfactory floor materials are: (a) wooden boards 1-1/4" square; (b) 1" by 1-1/2", or 1" by 2" boards, laid flatwise 1-1/4" apart; (c) 1" by 2" mesh, 11- to 12-1/2-gage, welded wire; (d) 1" square mesh, 14-gage, hardware cloth; or (e) 1" to 1-1/2" hexagonal mesh, 14- to 16-gage, fox wire.

Floors made of slats are more durable than those made of mesh wire. They are less conducive to foot and leg trouble; therefore, are better for large turkeys.

Frequently the inside covered portion of the platform is floored with wire, while the outside open portion is floored with slats. They are easier on the feet of the birds and provide a

### Raising Turkeys in Confinement (Contd.)

better walking surface for the attendant. This is important, especially if feeding and other activities are carried on inside the confinement quarters.

#### 4. Sidewall Material

Sidewalls of the rearing platform should be from 6' to 7' high. Ordinary heavy weight, square mesh, poultry fencing is the most practical material for the sidewalls, though 1-1/2" hexagonal mesh, 18-gage, or 2" mesh, 16-gage netting, is very good.

When feeders and waterers are hung to the sidewall, various sized grills, 12 inches high, should be placed in front of each feeder or waterer to accommodate the various size turkeys as follows: welded wire grills, slatted grills with openings 2" and 3" wide, or narrow space grills, which are adjustable.

For use in severe weather, the roosting section usually is boarded up on three sides. Adjustable openings that can be closed in stormy weather and opened in warm, should be made in the rear wall. This system will supply good ventilation and light, and encourage turkeys to use the roosts. In moderate and warm climates, the roof is sufficient and there is no need for sidewall protection.

The top of the open portion of rearing platforms may be left open. However, better protection is given if it is covered with medium weight poultry wire. When the top is left open, the sidewalls should be 7' high, and the flight feathers of one wing of the turkeys clipped, or the last joint cut off. (Reference page 63, Farmers' Bulletin 1409, United States Department of Agriculture.) Some growers have found it unnecessary to clip the turkeys' wings when using a 6' fence, provided a slanted-in, woven-wire antify is added to the top.

#### 5. Roofing Material

The roofed over section of the rearing pen can be covered with a number of different materials: over-lapping boards; galvanized metal or aluminum roofing; paper over sheeting; or any of the newer processed roofing materials which require no supporting sheeting.

In all instances, the roofing must have proper support and adequate pitch. It should provide 12 linear inches of roosting space per bird for small, 13-1/2 inches for medium, and 15 inches for large type turkeys. When birds are to be

Raising Turkeys in Confinement (Contd.)

reared in climates having severe weather, additional space, which is sufficient for the turkeys to use feeders and waterers, should be provided.

## 6. Roosts - Construction and Materials

Roosts may be built in the center of the rearing platform or against the edge. If placed in the rear of an enclosed shelter, openings that can be closed in bad weather and opened in mild weather should be provided. Low roosts are a necessity with large broad-breasted turkeys and high roosts are desirable with other types. They should all be built on the same level with their tops 4- to 6 inches above the floor. If it is necessary to have the tops of roosts more than about 8 inches above the floor, it is an advantage to nail strong wire, preferably 2- by 2-inch square mesh 14- to 16-gage, or 1-1/2-inch hexagonal mesh 16-gage, loosely over the tops of the roosts or tightly to their undersides to support the birds and thus prevent bruising and other injuries. Welded wire 2- by 4-inch mesh, 12-1/2- to 14-gage, may also be attached to undersides of the roosts, or slats may be used between the roosts, for this purpose. With this arrangement, the roosting section would not require any floor wire or slats--the wire on top or underneath, or the slats between the roosts, serve the purpose of the wire or slat floor. Wire or slats on top of or attached to bottom surface of the roosts are self-cleaning, whereas, materials placed 5 inches or a greater distance below the top surface of the roost are not.

E. Selecting a Variety

There are two classifications of turkeys--the Standard, which is a large bird, and the Non-Standard, which is considerably smaller. The variety should be chosen on personal preference, market demands, and general adaptability to each situation; and the strain possessing the characteristics best suited to the purpose, for which the turkeys will be used, should be selected.

Six standard varieties, popularly called breeds, of domesticated turkeys are recognized by the American Poultry Association, an organization having as its primary function the standardizing of varieties of poultry in North America. The Association publishes the Standard of Perfection which contains concise descriptions of breeds and types of poultry.



Raising Turkeys in Confinement (Contd.)

## 1. Standard Varieties

The Bronze.--The Bronze is the heaviest standard variety; toms weighing approximately 22 pounds, and hens 13 pounds at market age of 28 weeks. Its skin is creamy white, or yellowish white if pigment-producing feeds, such as yellow corn, are eaten in large quantities.

The White Holland.--The White Holland is medium in size; toms weighing approximately 20 pounds, and hens 12 pounds at market age of 28 weeks. It originated from the Bronze or the wild turkey; its skin is white or yellowish white.

The Bourbon Red.--The Bourbon Red is medium in size; toms weighing approximately 20 pounds, and hens 12 pounds at market age of 28 weeks; its skin is white or yellowish white.

The Narragansett.--The Narragansett is a medium-sized variety; toms weighing approximately 20 pounds, and hens 12 pounds at market age of 28 weeks. The skin is white or yellowish white as in the other varieties. Young Narragansett poults resemble Bronze poults and cannot be distinguished from them.

The Black.--The Black is a medium-sized variety; toms weighing approximately 20 pounds, and hens 12 pounds at market age of 28 weeks. It is known in England as the Norfolk turkey. The skin is white or yellowish white.

## 2. Non-Standard Varieties

The great majority of turkeys now raised in the United States are the non-standard varieties, the Broad Breasted Bronze, and the Beltsville Small White being outstanding examples.

The Jersey Buff.--The Jersey Buff is medium small in size; toms weighing 13 to 18 pounds, and hens  $8\frac{1}{2}$  to 11 pounds at market age of 24 to 26 weeks. It was developed through pedigree breeding and selection from crosses of Black, Bourbon Red, and Broad Breasted Bronze at the New Jersey Experiment Station, Millville, New Jersey; and is about 10 percent heavier than the Beltsville Small White at all ages. The light-colored pinfeathers are inconspicuous in the dressed bird.

Raising Turkeys in Confinement (Contd.)

The Beltsville Small White.--The Beltsville White is a small turkey; toms weighing 12 to 17 pounds, hens 7-1/2 to 10 pounds at market age of 24 to 26 weeks; also about 1/5 to 1/4 more turkeys may be raised with the same equipment and labor. This variety was developed by poultry scientists at the experiment farms of the United States Department of Agriculture, Beltsville, Maryland. It is identical in color with the White Holland but is smaller and is fast becoming popular with the buying public. It has a compact body, long keel bone, and abundant meat on breast and legs, and is suitable for small families and small ovens. Its white feathering is a further asset since white pinfeathers, when present, detract less than dark ones from the appearance of dressed birds.

The Charlevoix.--The Charlevoix is a small-type Bronze about the size of the Jersey Buff; toms weighing 13 to 18 pounds, and hens 8 1/2 to 11 pounds at market age of 24 to 26 weeks. It originated in Canada and is raised in limited numbers in that country.

The Royal Palm.--The Royal Palm is a new variety about the size of the Jersey Buff; toms weighing 13 to 18 pounds, and hens 8 1/2 to 11 pounds at market age of 24 to 26 weeks.

The Broad Breasted Bronze.--The Broad Breasted Bronze, although a non-standard variety, is a large turkey; toms weighing 22 to 24 pounds, hens 14 to 15 pounds at market age of 24 to 26 weeks. It is the most extensively used of all varieties; is distinctive for its body type; and yields about 6 pounds more of all lean meat per hundred pounds than other turkeys.

Of all these varieties the Broad Breasted Bronze, standard-bred Bronze, and crosses between them are by far the most popular, probably together comprising 90 percent of the turkeys in the United States.

All sizes and varieties of turkeys can be raised successfully and profitably in confinement (off the ground--on wire, slats, or pebbles). However, the smaller varieties are winning favor with growers using this system. With the small turkey there is less trouble with foot and hock deformities; a larger number can be raised in a given space; they can be marketed as broilers in 14 weeks, and mature as roasters in approximately two weeks less time; they meet the demand of small families and small ovens; and there is a market differential of from 5 to 15 cents a pound in their favor.

### Raising Turkeys in Confinement (Contd.)

Persons desiring information and advice pertaining to the selection of a variety, which is most suitable for their purpose, should communicate with the county agricultural agent in the community where they are going to operate; describe the system they intend to use in raising turkeys; tell whether they plan to market live or dressed turkeys; and explain whether they intend to sell direct to the consumer or to the wholesale trade. From this background of information, the county agricultural agent will be able to give practical advice concerning the variety best suited for the type of project to be undertaken.

#### F. Care of Turkeys

##### 1. Brooding

The following information was taken from "Turkey Management" by S. J. Marsden and J. H. Martin.

A satisfactory brooding device should provide the following:

The temperature near the center of the hover, one inch above the floor, should be 100° F. Near the floor, at the edge of the hover, 95° F is desirable, and the floor temperature of the room should be kept at about 70° F.

Uniform heat regardless of outside temperature.

Controllable heat that can be adjusted to the demands of the birds at various stages and under varying weather and management conditions.

Safety from fire.

Ventilation under the hover and in the brooder room, sufficient to avoid wet litter and also meet the requirements of the poults for fresh air.

Reasonable first cost and reasonable operating cost.

Heat may be supplied by coal, wood, oil, gas, or electricity, the choice depending partly upon the relative cost and availability of the various fuels.

It would be well for growers to consult the county agricultural agent in the community, where they will operate, for advice as to the type of brooder best suited for their purpose.



Raising Turkeys in Confinement (Contd.)

A practical brooding unit is about 150 poults. Many operators brood from 180 to 250 or even 300 per unit, but it is better practice and less risky to limit the brood to 150. About 1 square foot of brooder-house floor, or floor and porch space, should be allowed per poult if the birds are to be brooded for about 8 weeks. In most instances, turkeys are transferred to the rearing pens, at about 8 weeks of age, where they live until marketing time.

Brooding time (1 day to 8 weeks) is a critical period for turkey growers, as the start, turkeys get, largely affects their future development. They must be kept warm, dry, free from draft, have good ventilation, be fed well-balanced rations, be carefully watched to make certain they learn to eat and drink properly, and the brooder house must be kept clean and sanitary at all times.

Many kinds of litter, such as straw, shavings, peanut hulls, shredded cane, and sand, are used with varying degrees of success. However, wire floors remove the need for litter and are a help in disease control. Where wire floors are used, sufficient space between the wire and the floor should be allowed for adequate ventilation.

Compared to chicks, poults are more difficult to brood. They do not learn to eat so rapidly; they are more subject to fright, crowding, and piling; they do not take kindly to changes in feed or equipment; and they are more easily chilled. The essentials of success in poult brooding are good equipment and eternal vigilance. Overcrowding is very dangerous, and large units over 175 poults, are more difficult to handle than small units. Ample feeding and watering space and sufficient heat must be provided. Getting the poults out into the sun-porches or yards is good practice, but it must be done carefully and the poults watched continuously. If quick and easy access to the brooding room and to the brooder itself is not provided, the poults may crowd together in the corners of the porch next to the house. Boards or wire may be used to guide the poults back into the house openings.

## 2. Feeding

Feed should be kept before turkeys constantly from hatching to market age, and should be put in hoppers or troughs; not on the floor.

### Raising Turkeys in Confinement (Contd.)

For the first 24 to 72 hours after hatching, poults can live without feed or water, the yolk of the eggs which they have absorbed before hatching being sufficient to maintain them for that length of time. However, the sooner they are fed, the better; and in any event, they should be fed as soon as they are put into the brooder house, in order to prevent excessive eating of the litter. Poults kept from feed and water for much more than 24 hours after hatching learn to eat and drink with difficulty. It is common practice to see that the poults are fed and watered within 24 hours after hatching.

The first feed may be starting mash or crushed pellets (granules) upon which is scattered a little oatmeal or tender, finely chopped green feed. These materials should be placed in small heaps on clean boards, pie plates, or cup flats underneath the hover for the first day or two. Pelleted mash may be fed after the first 3 or 4 weeks, but poults do not take well to it at the start—they seem to prefer dry mash or granules. The feeding of liquid milk is not recommended for poults.

Although finely chopped tender green feed is good for poults in guarding against nutritional deficiencies and encouraging them to learn to eat, feeding it is usually impractical due to labor costs and difficulty in obtaining suitable types. Most turkey growers prefer to feed a complete starting mash so as to eliminate the necessity of feeding green feed.

Poults that will not or do not learn to eat and drink quickly may be saved by force feeding. Make a soupy mixture of regular starting mash with water or milk. Take the small end of a 25-cubic centimeter glass laboratory pipette in the mouth and by suction fill the pipette with the mixture. Open the poult's mouth, insert the large end of the pipette down the poult's gullet beyond the entrance to the lungs, then force out enough of the food to fill the crop comfortably. One such feeding usually is enough but two or more may be needed in stubborn cases.

Commercial starting mashes or "starters" in loose or granulated form are generally available; and in many localities, these are the only types of feeds obtainable. Ingredients necessary to make up good mashes may be available on the local market. In any case, the selection of a good commercial mash, or a good formula properly mixed containing high-quality ingredients, is necessary. Protein, mineral, and vitamin content are the main points to be considered. A standard starting mash or "starter" containing from 24 to 26 percent protein, or a high energy feed with 27 to 30 percent protein, is desirable.

Raising Turkeys in Confinement (Contd.)

Starting mash is recommended for feeding turkey poults during the first 8 weeks. This mash is a complete feed, needing no supplements except water and insoluble grit, such as granite, mica, coarse sand, or gravel, which may be hand-fed lightly on top of the mash. This starting mash should be fed along with clean water. Grain of the size fed to hens may be given with the mash starting at 6 to 8 weeks. Soluble grits, such as limestone, should not be fed. The mash in dry form should be kept before the poults at all times but stale mash should not be allowed to accumulate in the feeders.

Diets for growing poults after 8 weeks of age generally include both mash and grain. Keeping mash and grain before the turkeys at all times is the recommended method of feeding to promote normal growth and quick maturity. Usually special methods of fattening are not necessary--the birds being fed the regular growing feeds up to the time of marketing. Oats are a good fattening feed and usually are palatable to turkeys. Turkeys intended for fryers should be fed the mash and whole heavy oats starting at 6 to 8 weeks.

The following formula, if fed with insoluble grit and grain mixture containing at least one-third yellow corn and one-third oats, is a complete diet suited to turkeys reared in confinement without green feed, provided they have access to direct sunshine:

	Parts by Weight
Ground yellow corn .....	28
Wheat middlings or shorts.....	15
Alfalfa leaf meal or alfalfa meal containing 17 percent or more protein, dehydrated preferred.....	15
Soybean meal.....	15
Sardine fish meal.....	6
Wheat bran.....	6
Steamed bonemeal.....	6
Meat scrap (50 or 55 percent protein)	5
Ground oystershell or limestone.....	2
Riboflavin concentrate.....	1
Salt, fine sifted, preferably manufactured.....	1
Total.....	100



### Raising Turkeys in Confinement (Contd.)

Whole corn is not eaten liberally by turkeys under about 18 weeks of age; hence should be cracked and cleaned (freed of meal) when fed prior to that age. Rye, buckwheat, and rough rice are satisfactory feeds for use after turkeys are 8 weeks old, but should be fed in limited quantities and in combination with one or more of the common grains, such as corn, wheat, oats, or barley.

Feeding of two or more grains is good practice and does away with mixings. This is an advantage, especially where home-produced grains are fed. Cost and availability should determine the kinds of grains fed, as all have about the same value in turkey growing and fattening diets. From 9 weeks to marketing, supply a growing mash and grain. Records of feed consumed by large- and small-type turkeys, over a period of 24 weeks, show that 4 to 6 pounds are required to produce one pound of turkey meat.

During the last six weeks before marketing, turkeys should not be moved long distances or subjected to radical changes in management or feeding, as this might slow down the finishing process.

### 3. Cleaning

The following information was taken from "Turkey Diseases" by Hinshaw and Rosenwald; "Turkey Raising" by Marsden; and "Turkey Management" by Marsden and Martin:

Keeping housing and equipment clean and sanitary is the keynote to success for all turkey growers. Brooder house floors should frequently be cleaned, scraped, swept out, and then scrubbed, using water (preferably hot) containing a 13-ounce can of lye to 13 gallons of water. Reliable disinfectants such as coal-tar products i.e., cresol solution, may be sprayed on the floor and sidewalls. All equipment used for brooding should first be cleaned thoroughly.

All litter including droppings should be hauled to a place where turkeys cannot get at it. Infection and fly trouble can be reduced by composting or spreading the litter in the sun away from turkeys.

All movable equipment should be removed to a cement run or a cleaning platform for proper cleaning and disinfecting.

Raising Turkeys in Confinement (Contd.)

The walls, floors, and built-in equipment should be scrubbed with lye solution (1 can, or 13 ounces, to 20 gallons of water). Apply with an old house broom. Care should be taken by the worker not to get solution on hands, face, or clothes. Vinegar is an antidote. Time should be allowed for thorough drying before poults are put in the house. Lye is too corrosive to use as a spray on plaster or concrete, but is excellent for disinfecting wooden or metal (except aluminum) equipment.

Feeders and waterers should be made contamination-proof. All feed and water pans should be on wire platforms or on wire floors, if possible. The area around water pans should always be dry. All waterers should be kept clean by daily washing with brush or cloth followed by rinsing in clean water. Occasional disinfecting with chlorine or quarternary ammonium disinfectants, sodium orthophenylphenate solution, or other disinfecting solution not leaving a strong odor, may be used if disease is present. However, cleanliness alone is usually sufficient.

Feed troughs must be protected from contamination by keeping them covered with wire or slats having openings sufficient to permit turkeys of various ages to eat. They should be hung high enough from the floor so that the feed will not become contaminated with litter or droppings. Sour feed should never be allowed to remain in the feeders. Receptacles for milk should be washed and scalded daily. For poults only a few days old, feeders should be of wood strips similar to house laths or flat metal receptacles such as pie plates. The wood strips should be disposed of and replaced frequently, and the metal receptacles sterilized daily.

If no disease is present, feeders may be put on a cement floor or cleaning platform, washed with soapy water, rinsed with hot water, and dried thoroughly in the sun.

If a disease is present, feeders should be washed in soapy water and rinsed; then rinsed thoroughly in boiling water and sprayed with live steam or dipped in a 1 percent solution of formalin; or sprayed with, or dipped in sodium orthophenylphenate or a quarternary ammonium compound, diluted as directed on the package.

### Raising Turkeys in Confinement (Contd.)

Be sure to disinfect equipment, shoes, and overshoes, which have been used in a contaminated pen, before entering a clean compartment; or, after they have been used in a pen of older poults before using them in a pen of younger ones. Apply one of the general disinfectants (lye solution, sodium orthophenylphenate, compound solution of cresol, sheep dips).

The wire or slatted floors of rearing pens and all roosts should be kept thoroughly clean; and may be washed down with a garden hose, and scrubbed with a stiff broom or brush, when necessary. All droppings beneath the floor of the pens should be removed at close intervals and disposed of by spreading in the sun to dry or being decomposed in a compost pit or cabinet.

Feed storage houses should be dry and rodent-proof, to prevent illness among turkeys. Cleanliness alone will not eliminate illness or disease in a flock of turkeys, but it will do much to prevent trouble. Growers must expect a certain amount of disease and mortality; but it is better to prevent and control an outbreak in a flock than to try to cure sick turkeys. Diseased birds should be sent to the laboratories of the State experiment farm for diagnosis. The services are free and there is no excuse for guesswork. Dead birds should be disposed of by burning to prevent spread of disease.

#### 4. Feather and Flesh Picking

Feather picking is a mild form of cannibalism to which turkeys are very susceptible during the growing period, especially after they are about 12 weeks of age. It results in unsightly appearance, and more trouble from pinfeathers when the birds are marketed.

Feather picking is more serious when birds are raised in confinement. It may be prevented, or stopped completely, by "debeaking," or by a specially made turkey bit resembling a 1-1/4 inch hog ring hanging between the two jaws and adjusted to fit snugly in the nostrils of the turkey without penetrating the septum between them. This device prevents the beak from being closed completely, thus preventing feather picking. The "debeaking" should be done, or the bit applied when the trouble starts, usually at about 12 to 14 weeks of age.



Raising Turkeys in Confinement (Contd.)

Management practices that tend to prevent feather picking are: (1) Placing tightly stretched 11- or 12-gage wire on the feeders for beak cleaning; (2) avoiding overcrowding in confinement rearing; (3) providing 3-1/2 to 4 inches of feeder space per growing turkey, rather than the minimum allowance; (4) feeding an adequate diet; (5) feeding pelleted mash instead of mash in dry form; (6) feeding whole oats in fairly large proportion—about 50 percent of the grain portion of the standard mash-grain diet; and (7) not confining turkeys to roosts or restricted quarters, particularly in the early morning.

Head and neck picking occasionally results from fighting. Fighting usually is not serious among turkeys, provided injured birds have ample opportunity to escape.

Pine tar or chick-pick remedies, such as a mixture of 4 ounces of petrolatum, one-fourth ounce of carmine, and one-fourth ounce of aloes applied to the affected areas, offer temporary relief from picking.

#### 5. Diseases, Pests, and Common Ailment

Information on this subject was obtained from Farmers' Bulletin No. 1409, "Turkey Raising," and Farmers' Bulletin No. 1652, "Diseases and Parasites of Poultry;" "Turkey Management" by Marsden and Martin; and "Starting Right with Turkeys" by G. T. Klein.

At the slightest indication of disease, growers should consult the county agricultural agent for advice; and, irrespective of sight, the services of a veterinarian should be obtained, since the diagnosis and treatment of disease require special knowledge, skill, and experience.

The best way to fight disease in turkeys is by prevention and control; not by trying to cure sick birds. Not too much is known about how to care for a turkey once it gets sick; therefore, growers must expect some mortality.

##### a. Prevention

Disease prevention is too often thought of only in terms of impractical cleanliness. In practice, no one expects the poultry house to be spotlessly clean and free from germs. Cleanliness alone, although vitally important, will not prevent all disease.

Raising Turkeys in Confinement (Contd.)

Listed are some of the weapons and a plan of action poultrymen can use to prevent and control disease, parasite, and vice outbreaks in their flocks. They were taken from a reliable poultry manual published by a manufacturer and distributor of poultry feeds and insecticides. Each has its important place in the practical disease control program, and includes:

(1) Seven Weapons To Combat Disease---

- |                              |                  |
|------------------------------|------------------|
| (a) Blood testing breeders   | (e) Vaccines     |
| (b) Common sense cleanliness | (f) Insecticides |
| (c) Complete nutrition       | (g) Drugs        |
| (d) Mechanical devices       |                  |

(2) A Plan of Action to Keep Disease and Mortality at a Low Level--

- (a) Buy poults from a hatchery having pullorum-free breeding stock only; a sound sanitation program; and one that controls breeding flocks supplying its hatching eggs.
- (b) Get poults in new boxes and use feed from new bags.
- (c) Keep brooder and laying houses clean and dry.
- (d) Allow no mudholes, piles of trash, boards, or manure around poultry houses.
- (e) Keep unnecessary visitors out of your poultry houses.
- (f) Don't wait for a seriously sick poult to die--get rid of it at once.
- (g) Burn or bury all dead birds immediately.
- (h) Keep poults away from growing turkeys.
- (i) Vaccinate against fowl pox, Newcastle disease, and bronchitis if they are a threat in your area.
- (j) Keep poultry houses free of lice and mites.
- (k) Rats, insects, and wild birds should be kept out of poultry houses.

Raising Turkeys in Confinement (Contd.)

- (l) Use drugs where they effectively help prevent or control disease. Remember, no drug is a "cure-all."
- (m) Feed is important in any disease prevention program. Follow the recommended feeding program that fits the needs of your flock so your birds will be fortified with the good health that comes from complete nutrition.

## b. Common Diseases

In this section is listed some of the most common diseases, pests, and ailments affecting turkeys. Each is described according to its nature, symptoms, cause, and method of treatment.

Blackhead.--Blackhead is primarily an infectious disease which attacks the ceca and liver of turkeys; and may occur at any time in the life of a turkey, but is most serious in young birds. The fact that the head of the affected bird may become discolored has given it its popular name, blackhead.

Symptoms--Drooped wings, drowsiness, ruffled feathers, weakness, loss of weight, and sometimes a sulfur-colored diarrhea are the main symptoms. Death is often sudden. The discoloration of the head is seen also in other diseases and is not always present in this disease, so that the term "blackhead" is not a very satisfactory one. Post-mortem examination will show the liver to be enlarged and often spotted with dark red, gray, or yellow circular areas.

Cause--The parasite (*Histomonas meleagridis*) causing blackhead is one of the protozoa. The organisms live part of the time free in the cavity of the ceca or blind pouches; but in another stage of the disease, they apparently enter the walls of the ceca and are probably carried through the blood stream to the liver. The organisms in the ceca multiply in large numbers and pass out in the droppings. When the eggs from the droppings are eaten, in contaminated feed or water, and hatch in the intestinal tract, the blackhead organisms are transmitted to the bird and set up the disease.

Treatment--Although many drugs have been tried and some are recommended for the treatment of blackhead, none have been found to be of practical use. Control measures by disinfection of premises and by isolation of sick birds, to prevent development of the disease, is the only practical procedure.



Raising Turkeys in Confinement (Contd.)

Coccidiosis.—This disease is less severe in poults than in chicks, and if observed in time can be checked with less setback to the flock. Coccidiosis makes its appearance in poults from 5 to 16 weeks of age, although occasionally as early as 3 weeks. It is more common in poults, naturally brooded, as the mother hen serves as the source of infestation. The species which infect turkeys are different from those commonly troublesome to chickens, so cross-infection does not occur.

Symptoms—Drooped wings, ruffled feathers, listless appearance, diarrhea light brown and mucoid rather than bloody, although blood occasionally appears as the disease continues to run its course.

Cause—Infestation with parasitic organisms, especially of the genus *Eimeria Meleagridis*, a one-celled protozoan. The organism multiplies in the bird's body, so that considerable numbers of the parasite are later passed in the droppings. As a result the infection is spread to other birds. The organism may be carried or spread by flies, birds, insects, rats, and mice.

Treatment—The drug sulfagaunidine recently has been found to possess curative properties. It is administered at the rate of 0.5 percent in the dry mash for two or three consecutive days, water but no other feed being given. This treatment is sometimes given as a preventive, during the fourth or sixth weeks of brooding, in situations where coccidiosis threatens the flock.

Pullorum.—Pullorum is a destructive, typically diarrheal disease, formerly called bacillary white diarrhea; and is widespread, existing in every section of the United States where appreciable numbers of poultry are raised. The disease is usually acute, with losses up to 30 to 50 percent or more. The most susceptible age is from the first week through the third week, although heavy losses have been experienced as late as three months of age.

Symptoms—Droopiness, huddling together in warm places, ruffled plumage, skin on legs dry and wrinkled, and listless picking at feed. In cases not so acute, there is often a pasting up around the vent and labored breathing which indicates infection in the lungs. The droppings may be whitish, foamy, and sticky.

Raising Turkeys in Confinement (Contd.)

**Cause**--The disease is caused by a germ which is known as *Salmonella pullorum*. The organism may be transmitted in the egg or by contaminated food and water. Although the germ is quite easily destroyed by direct sunlight, heat, or disinfectants, it may remain alive in soil or manure in sheltered places for many days, or even months. The primary seat of pullorum infection is the ovary of the infected hen.

**Treatment**--The sulfa drugs have been reported as successfully used to prevent death losses from pullorum disease. Pullorum control involves obtaining eggs from disease-free flocks; hatching them in disease-free incubators separately from chicken eggs; and brooding and rearing the poults away from chickens, infected turkeys, and contaminated land or equipment. Blood testing of breeding stock is essential to an effective control program. Cleanliness and sanitary conditions are the most effective means of combating the disease.

**Erysipelas**.--This disease, though uncommon, may cause heavy losses in turkeys, mostly males, near market age. It is caused by the swine erysipelas organism, *Erysipelothrix rhusiopathiae* transmitted by sheep or swine.

**Symptoms**--Listlessness, drooping, aloofness, cyanotic (dark blue) head, nasal catarrh, swelling of the snood which may fall off, and fevers of 2 to 3 degrees.

**Treatment**---Affected birds may be saved by prompt injections of penicillin in proper dosage; 20,000 units of oil, 4 doses given 24 hours apart. Streptomycin (a single dose of 140,000 mcg.) proved 100 percent effective, while 80 percent of the untreated died, in a test by C. C. Grey (1947).

**Caution:** Erysipelas is transmissible to humans and may cause an itching rash on the skin.

**Newcastle Disease**.-- Newcastle disease, also known as avian pneumoencephalitis, is a highly contagious virus disease involving, primarily, the respiratory and nervous systems of domestic fowl. It is characterized by a sudden onset and extremely rapid spread through a flock. Turkeys are very susceptible. The time between exposure and appearance of symptoms may vary from 2 to 14 days. The average time is generally considered to be

Raising Turkeys in Confinement (Contd.)

about 5 days. The disease may be spread by direct or indirect contact. It may be carried from one farmyard to the next by visitors, such as poultry buyers, feed deliverers, and remedy salesmen. The practice of feed dealers of collecting used feed bags and reusing them causes some outbreaks of the disease. The virus may survive on infected premises for 2 or 3 weeks following an outbreak of the disease; and it is recommended that poultry houses be vacated for at least 30 days before being restocked.

**Symptoms**—Newcastle disease begins with respiratory symptoms resembling those of infectious bronchitis and laryngotracheitis. The first symptom observed is difficult breathing accompanied by gasping. Some turkeys emit a peculiar shrill cry which may be heard above the other sounds in a poultry house. The birds are visibly depressed and weak. A few days after the respiratory symptoms appear, nervous disturbances are encountered. The birds may lie on their sides, with paralysis of one or both legs or wings. The equilibrium is altered so that birds may do somersaults, turn over backwards, walk backwards, or twist the head and neck into all sorts of contortions. Tremor of the head is common.

**Treatment**—Medicinal treatment is of no value in this disease. Approved methods of poultry management should be followed to avoid introduction of the disease into a flock. Recovered birds may become carriers of this disease. Admission of visitors from potentially infected premises should be avoided.

c. Common Pests

**Lice.**—Four species of lice are found on turkeys. The large louse (*Gonoides meleagridis*) and the slender turkey louse (*Lipeurus gallipavonis*), are restricted to the turkey and may be markedly injurious to poults and may also cause severe annoyance to adult birds. The common body lice are found on both turkeys and chickens and may cause considerable irritation to both young and grown birds. The shaft louse may be present without evident bad effect. High mortality among hen-hatched or hen-brooded poults may result from infestations of head and body lice.



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**Symptoms**—Young poults fail to grow normally; mature birds may be in poor flesh. Lice may be seen easily by examining the upper thigh feathers and the bases of the fluff feathers below the vent. The unhatched whitish louse eggs (nits) may be seen in clumps about the base of the feathers. Some kinds of lice breed on the bird's body feathers, others on the head; young and old lice remain on the turkeys. Lice are yellowish to grayish in color, about 3/16" in length.

**Treatment**—Apply sodium fluoride among the feathers, working it well down to the skin, one pinch at a time on the head, the neck, the back, under each wing, below the vent, above the vent, and in the long fluff feathers on each side. Baby poults should not be dusted with sodium fluoride or any strong louse powder until more than a week old, and even then the powder should be applied sparingly. If turkeys are roosting in a house, lice may be controlled by applying a thin line of nicotine sulphate solution on the top surface of all roosts. Where a general delousing is needed, this method is effective and easily administered. Control of lice involves the destruction of the parasites and nits (1) on the birds themselves, and (2) in the house and litter.

**Mites.**—Red mites often flourish unsuspected in turkey roosting or nesting quarters, which should be inspected periodically. Their presence is indicated by grayish deposits or by the tiny mites themselves, which are red after feeding on the turkey's blood.

**Symptoms**—Loss of vitality and color indicate a loss of blood due to mites. The scaly-leg mite crawls under the scales of the shank causing the entire shank to appear rough, and the bird sometimes become crippled.

**Treatment**—Paint the underside of the roosts and roost supports with anthracene oil, crude oil, crankcase oil, or any coal tar disinfectant. Make the application light but thorough, and do it preferably in the morning.

**Ticks.**—The fowl tick, or blue bug, is one of the worst pests of turkeys in the warm sections of the country. It is a large insect resembling a bedbug, and can be controlled by the methods advised for controlling red mites, but the treatment must be thorough and persistent.

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**Worms.**--Turkeys are subject to attack from various species of roundworms, tapeworms, flukes, gapeworms, and gizzard worms. Treatment should not be undertaken until the presence and identification of the worms have been determined by examining the droppings or by post-mortem examination. Worm infestation can be prevented by sanitation and by the control of intermediate hosts, such as flies, grasshoppers, beetles, and other insect carriers.

**Symptoms**--Loss of weight, sagging wings, paleness, and occasionally diarrhea. However, birds may be fairly heavily infested and yet appear healthy. In most sections of the United States worms do not infest turkeys to any serious extent; yet in a few areas they may be troublesome. The ripened eggs pass through the droppings, incubate in the soil and litter, and soon infest other turkeys.

**Treatment**--Four percent of tobacco dust ( $1\frac{1}{2}$  percent nicotine) in the mash, fed continuously, is considered to be an effective control; however, any sanitation program that will avoid trouble from blackhead usually eliminates roundworm infestation. The use of worm remedies without a competent post-mortem examination, to prove the presence of a serious worm infestation, is to be discouraged.

**Manson's Eye Worm.**--The parasite (*Oxyspirura mansoni*), known as Manson's eye worm, infests chickens, turkeys, and peafowls, and can develop in various wild birds. This worm has an indirect life history, and its intermediate host has been shown by workers of the Florida Agricultural Experiment Station and elsewhere to be a cockroach. The cockroaches are found beneath boards, trash, and in the vegetation at the edges of fences; they feed on whatever food is present, including droppings of the fowls. From the droppings, the cockroaches obtain the eggs or newly hatched larvae of the roundworms, the eggs having been washed down the tear ducts from the eye of the fowl and having then been swallowed and passed in the droppings. The young roundworm develops in the body of the cockroach; and when the roach is eaten by a fowl, the worm is freed in the bird's crop. It passes up the esophagus to the mouth and then through the tear ducts to the eye.

**Symptoms**--Affected bird winks the eye continuously and frequently attempt to rub the head on the feathers of the wing, or to scratch at the eye with the foot. The eyesight is not good. There is puffiness around the eye and

Raising Turkeys in Confinement (Contd.)

a discharge from the eye and from the nostrils. Often a severe inflammation may result in blindness; at times, the entire eyeball is destroyed.

Cause—The parasite, *Oxyspirura mansoni*, is found under the nictitating membrane, i.e., the transparent membrane which passes over the eyeball of the fowl in the act of winking. The worms are slender, colorless, and about  $3/4$  of an inch long. They can often be detected by a firm pressing of the tear sac at the inner corner of the eye, when they will wiggle out over the eyeball.

Treatment—Two or three drops of a 5 percent solution of butyn should be dropped in the eye as an anesthetic. The transparent membrane should be lifted to place one or two drops of a 5 percent solution of liquor cresolis on the worms. The eye should then be washed well with warm water.

d. Common Ailment

Bumblefoot.—Bumblefoot in turkeys is abscesses of the foot pads. The ailment is seldom serious except in Broad Breasted Bronze. Bumblefoot may be confused with Staphylococcosis, a bacterial infection that sometimes causes swollen feet.

Symptoms—The abscesses have the appearance of corns. They are boil like infections and the bottom of the feet may be swollen. In severe cases the infections look like foot rot in other animals. The birds are lame. Growth is retarded and the weight reduced.

Cause—The real cause is not known. The probable cause is bruising or cutting of feet followed by an infection. Floors with rough edges and projecting points may result in moderate bumblefoot in all turkeys and serious bumblefoot in Broad Breasted Bronze.

Treatment—There is no cure for bumblefoot once it develops. If the birds get abscesses, put them in dry clean quarters and treat the pads with tincture of iodine or an antiseptic healing ointment such as ammoniated mercury or sulfa.

Floors made of poles or slats, having round edges, and roosts low enough to prevent bruising of feet when the birds hop to the floor, have possibilities in the prevention of bumblefoot.



Raising Turkeys in Confinement (Contd.)G. Methods Used by Blind Persons in Detecting Signs or Symptoms of Disease and Minor Ailments in Turkeys

To obtain accurate information on conditions which are warning signals of approaching trouble, contacts were made with turkey growers, both blind and sighted; county agricultural agents; veterinarians; specialists; and pathologists from the U. S. Department of Agriculture.

Whether blind or sighted, it is vitally important that turkey growers be able to detect the first signs of disease in their flocks, in order that they may administer treatment to prevent the outbreak from becoming widespread and financial loss serious.

Naturally, totally blind persons and persons with seriously impaired vision have difficulty in detecting the symptoms of certain kinds of illnesses and must rely, to some extent, upon sighted help for information. It is for this reason that arrangements should be made for someone, such as a sighted member of the family, a neighbor, or a supervisor provided by a feed dealer, to look the flock and premises over, at frequent intervals, and advise the blind person regarding their condition. In all instances, even though sighted assistance is provided, the services of the county agricultural agent are of vital importance; and arrangements should be made for him to make regular inspection tours and advise the blind operator regarding the condition of his flock, in order that he may follow the best practices and use the proper methods to prevent disease.

#### 1. Conditions

In the raising of turkeys for meat, there are two definite conditions that indicate approaching trouble and can be identified by sound or touch.

Inactivity.--Healthy turkeys are alert and active. They cheep, chatter, eat well, run and jump to catch insects, and fly at the slightest disturbance. The absence of any of these traits is an indication of trouble.

It is difficult, of course, to detect these symptoms in a few turkeys when a person is attending to a large flock. However, it is the experience of blind poultrymen that, even when a few turkeys become inactive, fail to respond to fright, and squat listlessly in the pen, the attendant usually locates them with his feet. With these warning signals, a blind person will know to call the

Raising Turkeys in Confinement (Contd.)

county agricultural agent, or a veterinarian to analyze the difficulty and administer such treatment as may be necessary to prevent, or at least, lessen the seriousness of disease in the flock.

Decrease in Feed Consumption.--Good poultrymen carefully weigh and apportion the quantity of feed to be consumed daily by their flock. When the birds fail to eat all of the feed, it is an indication of approaching trouble. The blind poultryman, of course, easily detects this condition by running his hand into the hopper containing the feed.

One county agricultural agent has the following to say:

"Feed consumption usually drops one or two days before outward symptoms of sickness are noticeable. By measuring just the right amount of feed needed each day and placing it in the feed hoppers early each morning, a blind person will know that there is something wrong with his flock if any feed is left in the feeders from the day before. He can then call the county agricultural agent or someone else to immediately make an early diagnosis so that remedial action can be taken before the trouble reaches an advanced stage or gets completely out of control. A person with sight will often wait until he sees outward symptoms of trouble before taking action. Sometimes this is rather late."

A representative of a large feed concern, who is an authority on the raising of broilers, has this to say:

"By keeping daily records of feed consumption, you can notice a decline as soon as it appears. This is a definite sign that something is wrong. Correcting a problem in its development is much easier than suddenly to find out your flock is 'off feed' and a serious respiratory outbreak is affecting the growth and uniformity of your broilers."

2. Examples of Diseases Detectable by Touch, Sound, or Both

Touch.--Many ailments in turkeys are identified by touch. The birds droop, squat, are listless, or remain under foot, all of which are indications of some kind of approaching sickness, such as coccidiosis and hexamitiasis, blackhead, trichomoniasis, pullorum, infectious sinusitis, Newcastle, and erysipelas. (For symptoms see subsection on Diseases.)

### Raising Turkeys in Confinement (Contd.)

Sound.--All respiratory diseases are easily identified by sound. The birds gasp for breath, sneeze, wheeze, or have rattles in their throats, all of which are indications of approaching sickness, such as infectious sinusitis (air sac), Newcastle, pneumonia, and bronchitis. (For symptoms, see subsection on Diseases.)

Note: Infectious sinusitis and Newcastle may be detected by either sound or touch.

## H. Marketing

### 1. When to Market

According to information contained in "Farmers' Bulletin 1409," U. S. Department of Agriculture, experiments with standard-bred and Broad Breasted Bronze turkeys have shown that well-fed young birds of these varieties are marketed to best advantage at ages ranging from 26 to 30 weeks, the average being 28 weeks. Under the most favorable conditions, hen turkeys of these varieties may be ready for market as early as 24 weeks and the toms at 26 weeks. However, many are marketed at 24 to 26 weeks that are somewhat deficient in fat and possess numerous short pinfeathers. In general, if turkeys are kept longer than 30 weeks, the cost of further grains and the extra labor for their care cause the cost of production to rise rapidly.

Small type varieties usually are ready for market at 22 to 26 weeks of age; however, they may be marketed at 14 weeks as broilers. As with the larger varieties, conditions of rearing may affect the time required to produce market birds. Cool weather, during the later growth stages, tends to speed up growth and subsequent maturity in all types of turkeys.

### 2. Selecting Turkeys for Market

If rearing conditions have been satisfactory, the inspection of a few representative birds will serve to tell whether or not the flock as a whole is ready for market at the usual age. Under most conditions, it is important to market only turkeys which are fat and free from short, unpickable pinfeathers. To determine market quality, suspend the bird by the legs and examine the skin around the shoulders, over the breast, and on the drumsticks for presence of pinfeathers too short to be cleanly picked without leaving a deposit of feather pigment in the skin. If noticeable numbers of short pinfeathers are present, the bird will not pick clean.



### Raising Turkeys in Confinement (Contd.)

Defects due to injuries before and after the birds are killed are common and cause loss of grade. Great care should be taken not to allow the birds to bruise themselves by flying or running against obstructions or by piling up; therefore, smothering and trampling each other. The use of a catching chute or a small catching pen is recommended. A strong catching hook is useful.

#### 3. Shipping Live Turkeys

In shipping live turkeys, it is a good plan to consult the buyer and transportation company regarding details of crating and handling.

Careful handling of turkeys will do much to insure top prices. Birds with broken legs and wings, and with bruises due to rough handling, go into lower grades and sell at lower prices. Crowding too many birds into the market coop may result in some being smothered or trampled and scratched so badly that they are almost a total loss. Allow room for all of the birds to stand fairly comfortably in the coop.

Coop size is important. It should be deep enough to allow the birds to stand but no deeper. Shallow coops force the birds to rest on their breasts, which if bruised, result in a lower grade classification. A height of 18 inches is recommended for turkeys.

Since turkeys frighten easily and fly, thus bruising their flesh and frequently breaking bones, it is advisable to use a catching chute when catching and crating for market. The use of a catching chute prevents turkeys from piling, and enables the operator to catch them by the legs without being seen. One type of chute is 4' to 8' long, 24" to 30" wide, and 3' high. The top is solid and there is no bottom. There is a sliding gate in each end and a set of fencing wings for one end. One or both sides may possess a slatted or wire covered framework which is covered with burlap coming to within an inch of the ground. The slatted framework comes to within about 12" to 16" off the ground. Birds are driven into the chute by way of the wings and are removed easily by the legs under the burlap.

#### 4. Processing Turkeys for Market

Marketing dressed turkeys requires much more experience and special equipment than the average producer possesses or

Raising Turkeys in Confinement (Contd.)

the size of his project warrants. Dressing turkeys for shipment is a rather hazardous business, and a careful study should be made before dressing is attempted. It would be advisable to arrange for some demonstrations before attempting to dress turkeys on a large scale. See the county agricultural agent for details.

In farm processing plants, turkeys are usually killed by one or two methods--cutting the bird's throat from the outside or from the inside. Cutting from the outside is the most popular method. Regardless of the method used, the large vein and the cross vein should both be cut.

In the standard method of slaughtering and picking, the bird is hung up by the feet with the head held in one hand by the operator. Barrels, funnels, and shackles hung from the ceiling, or line, rope, or cord hung from ceilings or pipes are used in killing and bleeding poultry. Killing by cutting the birds' throats from the outside and throwing them into barrels is the most efficient method from the standpoint of time and travel. However, from the standpoint of quality maintenance, carcasses of birds put into funnels or hung by shackles are superior, as the muscular spasms of birds thrown into barrels cause bruises.

Wet picking is the method most commonly used today. Birds are immersed in hot water ranging in temperature from 128 to as high as 190°F. Turkeys are often wet picked after being in water at a temperature of about 139°F, for a period of approximately 30 to 35 seconds for young birds, and from 40 to 50 seconds for adult birds. The time of immersion in a scalding tank depends upon the temperature of the water as well as the kind, class, and age of the birds. Experimental work on the part of the turkey grower is necessary to ascertain the scalding time and temperature required to prepare birds to suit consumer demands. Since it is necessary for the hot water to reach the skin of the birds, the water in the scalding tank should be agitated during the immersion, or the birds should be kept in continual motion while in the water. Scalding tank water should be kept clean. This is important as some of the scalding water may be absorbed internally by the birds or when the external skin is torn, dirty water may cause the flesh to become contaminated.

There are two methods of picking turkeys--machine and hand. Machine picking is much more rapid than by hand. However, mechanical pickers need frequent attention from the standpoint of cleanliness; otherwise, all the carcasses may become contaminated by the continued accumulation of filth.

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Picking by hand is the most common method; and a definite and desirable order for the removal of feathers is as follows:

1. Main tail feathers
2. Primaries and secondaries of the wings
3. Back
4. Legs
5. Area around vent
6. Contour feathers of the wings
7. Breast
8. Neck

A small handful of feathers should be pulled at a time, especially on the breast and thighs which are easily torn.

Pinfeathers can best be removed by use of a poultry pinning knife or other instrument such as a strawberry huller. When pinfeathers cannot be removed without digging into the skin, they should be allowed to remain because a skin injury is worse than a pinfeather.

After pinning, the birds are singed by rotating them while being passed over a flame, in order to remove the hairs. On farms, singeing is done by use of bottled gas, a blow torch, an alcohol burner, or a kerosene burner.

Feed is stripped from the crop by massaging the crop and neck and forcing the feed out of the mouth. This is preferable to making an incision as it lessens the danger of spoilage and gives the bird a better appearance. Vents are squeezed to force out the fecal matter which may still be in the lower intestines. This is accomplished by pressing on the abdomen just below the vent.

In the final washing, the carcass should be passed through a spray or sprays which provide an abundant supply of fresh clean water either under pressure or for scrubbing action.

Rapid chilling is essential in maintaining high quality of fresh-killed poultry. Chilling increases the length of time that birds may be held without off-flavors developing. There are two general methods of chilling used on farms--ice and water chilling and air chilling. Ice chilling is most often used.

In most farm processing plants, hogsheads, milk coolers, or large metal or hard-surfaced tanks are used for ice and



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water chilling. All containers and equipment should be thoroughly cleaned with hot water and soap at least once a day. Only ice produced from water, suitable for drinking, should be used in vats or tanks. A temperature under that of 40°F. should be maintained at all times during chilling. Chilling tank water must always be clean. Only perfect and thoroughly cleaned birds should be placed in chilling tanks.

The length of time carcasses should be allowed to remain in chilling tank is as follows: birds of less than 8 pounds, 6 hours; birds 8 pounds and over, 8 hours; or when the internal temperature has reached 36°F.

In air chilling (unless the birds are dry picked), after being passed through a spray of clean water, the birds should immediately be hung on racks, ropes, or shackles.

## 5. Marketing Procedures and Trends

The marketing season for the bulk of the turkey crop usually is comparatively short, extending from early November through late December. However, there is an increasing demand in the winter and late summer for fresh roasting turkeys and a year-round market seems likely to be developed soon. Many turkey raisers sell their birds alive to poultry dealers who either dress or ship them alive to city markets. In sections where turkeys are grown in large numbers, dressing plants have been built by cooperative associations or by poultry processors who collect the birds and dress them for market.

Farmers near city markets often dress their turkeys and sell them direct either to the consumer or to city dealers. In territories adjacent to large cities, marketing of both live and dressed birds at roadside markets has become common. Some growers have developed profitable gift-package businesses, delivering by truck, express, or parcel post. The dressed turkeys are shipped in sealed packages containing dry ice--about 1 ounce of ice per pound of turkey.

In certain localities, turkey growers may take advantage of the unique method of marketing turkeys by conducting a "Turkey Shoot." A true example is that of a small grower who began with 150 poults. When marketing time came, the owner, who was quite a sportsman, decided to hold a "Turkey Shoot." He furnished the shells and charged \$1 for each shot. The number of chances or shots was determined by the number of pounds of live weight per turkey; thus an 18-pound turkey at \$1 per shot would net \$18 minus the cost of the 18 shells.

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This method of marketing proved so satisfactory and successful, that over a period of 6 years he built his turkey business up to 750 or 800 turkeys per year, each of which was marketed through shooting matches held from the first of November through the end of December. This brought a tremendous profit in comparison to the normal or conventional methods of marketing poultry.

New marketing developments which have helped to popularize turkey meat and definitely appeal to homemakers are: eviscerated turkeys (whole) ready for the oven and sometimes stuffed with dressing; turkeys cut into halves, quarters, steaks, or smaller pieces; and the availability of the small-type turkey.

#### I. Record Keeping

The many details which are of vital importance to the success of poultrymen make some form of record keeping a necessity. A good system of records keeps the business on a sound basis; reflects the economic possibilities of poultry; develops business leaders; provides poultry raisers with helpful and timely information; and assists in establishing a favorable credit rating. Daily records should be kept of feed consumption, expenditures, and income.

Turkeys should be given all the feed they will clean up. The kind and amount they eat will increase with their age, and any decrease in feed consumption is an indication of some form of approaching trouble. For this reason it is necessary to carefully weigh, and keep a daily record of all feed consumed by turkeys of different sizes and ages. Record-keeping-cards for this purpose can be obtained from all feed stores; poultry growers associations; and the State Departments of Agriculture.

Successful turkey growers keep a detailed accounting of all expenditures and income as follows: Cost of poults; cost of buildings and materials for constructing rearing pens and other facilities; brooders; waterers; feeders; tools; feed (starting mash, growing mash, growing pellets, fattening pellets, grain, oyster shells, and grit); medicine; disinfectants; insecticides; veterinarian services; insurance; interest; electricity; water; depreciation of buildings (5% per annum); brooders and other equipment (10% per annum); loss of poults from death or other causes; transportation; and when the project is not a full-time operation, man-hours of labor.

Income from all available sources should be carefully recorded. It may include returns from the sale of live or dressed

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turkeys; turkeys eaten by the family (credited at prevailing market prices); and by-products, such as the sale of fertilizers and feathers.

Account books especially compiled for the use of keeping records of expenditures and income of farm projects may be obtained from State Departments of Agriculture.

J. Training

Training in the proper use of scientific methods of poultry management and modern equipment is of the utmost importance to poultrymen, whether blind or sighted.

Information obtained from bulletins published by the U. S. Department of Agriculture, State departments of agriculture, and associations interested in research and improvement of the poultry industry, proves that most successful growers are trained persons who avail themselves of every opportunity to improve their methods and increase their knowledge of the poultry business.

Irrespective of sight and training, everyone is not suited, either by temperament or physical make-up, to be a poultryman. Therefore, it is important that blind persons, before planning a training program for the raising of turkeys, make certain they possess the abilities and qualifications essential to their happiness and success. They should be well adjusted to their blindness; able to qualify for the job of raising turkeys in confinement (as described under "Job Specifications," page 44); possess at least average ability to do simple construction work and make minor repairs on buildings and equipment. They must like the kind of poultry they are to raise; have no aversion to working with sick poultry or performing the somewhat distasteful tasks of cleaning and sterilizing dirty, foul smelling poultry houses; be able to take reverses without becoming unduly discouraged; like to work alone; have no objection to being tied closely to their work and kept at home; be willing to work long hours; like to attend to details; be punctual and perform their duties regularly; and be willing to meet emergencies as they arise, day or night.

After careful consideration has been given to the many factors affecting the lives of individuals, and it seems reasonable to assume they will be successful in raising turkeys, a comprehensive program of training which will meet the needs and desires of the individual should be developed. The training plan should be written out in detail. Where training supplies, materials, or equipment is required, the trainer, all materials, equipment,



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and supplies should be approved by the County Agricultural Agent, the State Commissioner of Agriculture, or some other recognized authority.

The kinds and amount of training required to fit blind persons for raising turkeys in confinement will vary in individual cases. It will depend upon such things as their background of experience, education, skills, knowledge of poultry and poultry work, the methods they plan to use in marketing, and whether they will be working entirely alone or occasionally have the assistance of a sighted person.

Turkey growers, especially operators of small and medium-size projects, must possess a wide variety of skills (in addition to their knowledge of turkeys), for their responsibilities are those of manager, planner, supervisor, laborer, and businessman.

Operators of large projects seldom take part in the daily work of caring for turkeys and constructing and repairing equipment. Therefore, the variety of skills they possess need not be so diversified, since they must employ several workers, each of whom must have the ability to perform the different tasks that are essential to the success of the project.

Before undertaking to raise turkeys, it is strongly recommended that blind persons who have not acquired the necessary knowledge and skills through experience or working with others engaged in the business, should take a course of training in the care of poultry, poultry management, and farm shop work.

Some of the training programs now in operation are described in the following paragraphs:

1. In a few States, the agency providing vocational rehabilitation services for the blind and the College of Agriculture work together in organizing and conducting farm training programs for the blind.

In some instances, persons are enrolled as special students and receive instruction through lecture courses, class discussion, and supervision in the physical performance of the details of the daily work as it is conducted on the college farm.

In other instances, specialists from the various farm divisions of the college serve as consultants and advisers to the vocational rehabilitation counselors working with farm clients. The counselors then confer with the county

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agricultural agent and select an experienced and successful farmer who observes, supervises, and assists the trainee in the operation of his project which has been set up on his own farm. The farmer who acts as supervisor makes regular reports on the progress of the trainee to the rehabilitation counselor and the county agricultural agent.

2. A private agency, the Cincinnati Association for the Blind, operates a farm school for the blind at Mason, Ohio. Courses are offered in the care of poultry and poultry management, dairying, bee keeping, hog raising, farm maintenance, and farm shop work. As the demand arises, other courses are added to meet the needs and desires of individual trainees.

Trainees attend lectures given by specialists from the various divisions of the agricultural college, and take part in the daily work under the immediate supervision of their instructors and the superintendent of the farm. In addition, trainees are given instruction in orientation to a farm situation and afforded an opportunity to participate in outside activities which are of interest to farmers (Grange meetings, and special classes conducted under the direction of the home demonstration agent and county agricultural agent, or instructors of vocational agriculture). Upon completing training at the farm school, some State vocational rehabilitation agencies assist the trainee in setting up a project on his own farm under the immediate supervision of the county agricultural agent. A reputable farmer supervises and advises the trainee on the best methods of operation. The farmer and the agent also make regular reports on the trainee's progress to the Vocational Rehabilitation Counselor.

3. One State agency, Missouri, has a farm training program which it operates on a 143-acre farm under the direction of the owner, who is a graduate in agriculture, a successful farmer, and has about 5/200 vision. Programs are set up to meet the needs and desires of the individual trainees; and in most instances, extend over a 9-month period.

Before completing the course, each trainee takes over the entire management of the farm for one month, and outlines the plan he intends to follow on his own farm.

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The rural specialist makes frequent checks on the trainee's progress and assists in setting him up on his own farm, where he completes his training under the supervision of the county agricultural agent.

4. Most State agencies have no regular plan for training clients to become farmers or farm workers. Individual training plans are made by the rehabilitation counselor as the demand arises; and such trainers as feed dealers, individual farmers, and county agricultural agents are employed to observe, advise, and supervise the projects. Trainees, under this plan, acquire their knowledge from supervised work experience and reading of textbooks and bulletins published by authorities on the particular farm activities in which they are interested. In some instances, on-the-job training as a farm worker is considered most practical.

When training, as described in this section, is given a client, it is of the utmost importance that regular reports of the trainee's progress be made to the vocational rehabilitation counselor, in order that he may evaluate the training and provide additional assistance as may be necessary.

K. Cost of a Training Project

No attempt will be made to estimate the cost of purchasing land or erecting buildings. These factors fluctuate and differ greatly in the various parts of the country and will be governed by local conditions and personal situations. Many persons own or have access to a small piece of land in the suburbs, a small acreage in the country, or an unused portion of a general farm which could easily be equipped to keep turkeys. Frequently, the property has unused buildings on it, such as a garage, poultry house, or shed that can be converted into sanitary and convenient quarters for turkeys; and a person who is handy with tools can often do the necessary work with little or no financial outlay. Often there is sufficient quantity of scrap lumber about the place to build rearing pens. The utilization of these materials cuts the financial outlay for equipment decidedly and requires mainly initiative and skill on the part of the operator. When it is necessary to purchase lumber, nails, and a few incidental items, the cost will be very little.

Since it is impossible to know all the conditions and circumstances affecting the starting of a project, the example, given below, is based on three conditions; namely,



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1. That the client have adequate space and housing for raising 300 turkeys; that the building in which they are housed needs only minor repairs; that there is sufficient scrap lumber, poles, and materials about the place to construct rearing pens and roosts; and that the client has the skill and ability to make the necessary improvements himself;
2. That the client purchase 300 one-day-old poults--the first lot of 150 to be the small type turkey, started the first of February, and marketed the last of May (about 14 weeks) as broilers; and the second lot of 150 to be the large type, started the last of May, and marketed the last of November (about 24 weeks) as roasters; and
3. That all feed consumed be purchased.

Example: Any space containing approximately 200 square feet which can be kept warm; free from rodents; dry; well ventilated; free from drafts; and provides some sunlight, will accommodate 150 poults during the brooding period of 8 weeks. Additional space, separate from the brooder house and rodent proof, should be available for storing feed.

According to information obtained from county agricultural agents in different parts of the country, lamp-heated brooders are inexpensive, efficient, and adequate. A heating device that will take care of 150 poults is estimated to cost approximately \$10 (exclusive of labor), including minor electrical installations and heating bulbs.

Feeders and waterers can be made for brooder houses, or purchased for a very small sum, approximately \$10. Sanitary feeders and waterers to accommodate 150 growing turkeys can also be built at a good saving, or purchased for about \$25.

According to information obtained from county agricultural agents and hatcheries, day-old turkeys, small type, from strains having disease free records, can be purchased for 55¢ each, and large type for 75¢ each, or \$195 for 300 poults. Prices will fluctuate from year to year based on supply and demand.

Reliable data shows that both small and large-type turkeys raised in confinement to market age of 24 weeks require 4 to 6 pounds of feed to produce one pound of meat; that 3 pounds are required to produce one pound of the small type turkey to market age of 14 weeks; that the average cost of feed (mash and grain) in 1953 was \$5.50 per hundred weight; that the cost of electric heat and medicine is approximately 1¢ per pound of

Raising Turkeys in Confinement (Contd.)

turkey meat; and that the successful growers raise approximately 90 percent of their turkeys to market age. Using these figures as a basis and taking 4.4 pounds as the amount of feed required to produce one pound of the large type turkey to a market age of 14 weeks, it would cost 25.2¢ to produce one pound of large type turkey meat, and 18¢ to produce one pound of the small type turkey.

Consider that one-half of the flock (135, after deducting 10 percent mortality) averaging 8 pounds each is sold for broilers at 14 weeks of age, the cost of feed, heat, medicine, and poults (150 at 55¢ each) would be \$271.50; and feed, heat, medicine, and poults (150 at 75¢ each) for large type turkeys averaging 17 pounds each at 24 weeks, would be \$698.40.

The items of cost for establishing a training program as described in the above example are as follows: Feeders and waterers for brooders, \$10; heat lamps and wiring, \$10; materials for building feeders and waterers for growing turkeys, \$25; 150 poults at 55¢, and 150 poults at 75¢ each, \$195; feed, heat, and medicine for small type poults raised to market age, \$189; feed, heat, and medicine for large type poults raised to market age, \$585.90. Total cost of project, \$1,014.90.

The returns from the sale of 135 8-pound small type turkeys (1,080 pounds) at the 1953 live weight market price of 41¢ per pound, is \$442.80, less the cost of \$271.50, or net return, \$171.30.

The returns from the sale of 135 17-pound large type turkeys (2,295 pounds) at the 1953 live weight market price of 34¢ per pound, is \$780.30, less the cost of \$698.40, or net return, \$81.90.

The net return from the sale of both small and large type turkeys (\$253.20), less the cost of equipment purchased for the project (\$45.00), would be \$208.20.

In training projects conducted in areas of the country where the operator can raise grains and green feed, the cost will be cut materially from that given in the example.

### III. REMARKS

The above information was obtained from a personal observation, analysis, and performance of the operations involved in the raising of turkeys at the farm of Steve Alsaesar, a totally blind man, Cincinnati, Ohio; the text "Turkey Management" by Marsden and Martin; "Starting Right with Turkeys" by G. T. Klein; Farmers' Bulletin No. 1409 titled

Raising Turkeys in Confinement (Contd.)

"Turkey Raising", and Farmers' Bulletin No. 1652, "Diseases and Parasites of Poultry" published by the U. S. Department of Agriculture, Washington, D. C.; and two county agricultural agents who have observed and worked with successful poultry raisers who are blind.

Authorities agree on all of the important phases of the industry, and persons contemplating the raising of turkeys should avail themselves of the information derived through research and the experience acquired by persons engaged in the business.

Irrespective of sight, growers should, at the first sign of disease in the flock, consult the county agricultural agent for advice, obtain the services of a veterinarian to diagnose disease and administer treatment. (See pages 20 to 28 on Diseases, Pests and Common Ailment); take advantage of current information developed on scientific methods of feeding, care, and management; and attend schools conducted by the National Turkey Improvement Plan for training growers in methods of selecting turkeys for marketing and grading dressed turkeys.

All of the operations involved in the raising of turkeys have been observed, analyzed, and performed by a totally blind staff member in Services for the Blind; and it has been determined that sight is not necessary for successful performance of the daily tasks or management of the business. An unusually high percentage of the tasks involved are performed by a blind person in the same manner as by a sighted person. Blind persons possessing the skills to successfully care for turkeys will usually have imagination and ingenuity sufficient to solve problems as they arise, such as purchasing a Braille thermometer for controlling temperature.

The raising of turkeys provides four distinct possibilities; namely, an opportunity for:

1. Families of small means and with limited space who by raising their own meat, will reduce their living costs;
2. Operators of general farms or projects of a mixed nature who want to increase their number of activities to supplement their sources of income;
3. Growers wishing to engage in a project for the exclusive purpose of marketing live and dressed turkeys to the wholesale and retail trade; and
4. Persons desiring to establish a business selling dressed turkeys, with or without stuffing; in halves; or cut-up and sold by the piece direct to the consumer.



Raising Turkeys in Confinement (Contd.)

Before deciding to engage in a project of a commercial nature, blind persons should make certain that:

1. There is a dependable market;
2. They have selected a variety which is best suited for the type of customers to be served;
3. There is a reliable source from which to purchase hatching eggs and poults having a disease-free record;
4. They possess a working knowledge of the business acquired through experience or training;
5. They are familiar with the services of the National Turkey Improvement Plan; Turkey Growers Association; the State and Federal Experiment Farms; and the U. S. Department of Agriculture;
6. They are familiar with the services provided farmers by the various County, State, and Federal agencies; and
7. That arrangements are made for sighted help to advise and assist with the activities which require sight.

## IV. JOB SPECIFICIATIONS

Tasks Performed

The operator obtains the various types of feed, including the concentrates and succulents, from source of supply, and stores it in feed room or building adjacent to the turkey house. He measures and weighs the feed and places it in the feeder. He sterilizes and fills the water containers. The brooders, rearing pens, and equipment are kept clean, sanitary, and in good repair. He keeps simple records of his expenses and income. He must constantly watch for the first sign of disease. He sells his stock by contacting his customers by letter, phone, or in person.

## V. REQUIREMENTS

Physical: Active age; standing and walking most of the time. Bending is required to care for turkeys and repair buildings and equipment.

Feet: Ability to walk, stand, and stoop.

Hands: The use of both hands.

Raising Turkeys in Confinement (Contd.)

Thumbs: The use of one or both.

Fingers: Index, middle, and ring finger on one hand or both.

Vision: No vision required in the daily process of work.

Hearing: When the worker is blind, good hearing is required.

Mental: Alertness, good memory, coordination, and ordinary pace.

Educational: Understanding of the English language; ability to read and write is important, but this service could be supplied by a member of the family or a reader may be hired.

Physical Environment: Usually in small or medium-sized buildings (turkey house and rearing sheds); noisy; works alone or with sighted help, as required.

## SPECIALTY FARM

## RAISING TURKEYS

## CHAPTER II - RAISING TURKEYS ON THE RANGE

## II. OPERATIONS INVOLVED AND FACTORS TO BE CONSIDERED

The following information was secured from a personal interview with Mr. VaNon Dahle, a totally blind man and his sighted wife, who raise turkeys on the range near Clarkston, Utah; from a comprehensive study of bulletins, books, and journals published by the U. S. Bureau of Animal Industry; books written by authorities on the subject; and from consultations with two county agricultural agents.

Many of the operations involved in the daily work of raising turkeys on the range require full use of sight. However, it does not follow that a blind or visually impaired person, with sighted assistance, cannot be successful in raising turkeys by this method.

Mr. VaNon Dahle, a totally blind man, who raises turkeys on the range, has demonstrated that about 75 percent of the work can be performed successfully without sight.

A. Advantages and Disadvantages of the System

Some of the advantages of raising turkeys on the range are:

1. Lower cost for feed and equipment;
2. Less trouble from breast blisters, feather picking, cannibalism, and foot and hock deformities;
3. Less difficulty in supplying an adequate diet.

Some of the disadvantages are:

1. A large area of land is needed for range and the turkeys are not under the direct control of the operator. These conditions make it mandatory that operators, who are blind and those with serious visual impairments, have the assistance of sighted persons.
2. The large area of land needed for range makes it more difficult for persons, with a small amount of land and little capital, to get a start;



Raising Turkeys on the Range (Contd.)

3. There is more danger of losses from predatory animals, thieves, parasites, and soil borne diseases such as blackhead;
4. It is more difficult to provide adequate shelter from extreme heat, cold, and inclement weather.

B. Points Necessary for Success in Raising Turkeys

1. Try to locate near a good market. This may be near a small town or city, and should always be accessible to buyers of live turkeys;
2. Since turkey production requires a high investment per bird, make careful inquiries as to the different types and sources of loans available for financing the production phases and marketing operations;
3. Before building any production or marketing facilities, make a decision as to whether turkeys will be sold alive only, or whether investment in processing equipment would be wise;
4. Determine the kinds and classes of turkeys wanted by buyers of both live and processed turkeys;
5. If processing is to be done, try to locate on a busy highway;
6. Processing facilities are expensive. Be sure to take into account the additional investment necessary to maintain this kind of marketing;
7. If the annual volume is as large as 2,000 birds, consider the use of a picking machine;
8. Become acquainted with existing Federal, State, and municipal regulations which pertain to processing, transporting, selling, and other applicable operations;
9. Discuss all plans in detail with the county agricultural agent and turkey marketing specialists in the State College of Agriculture. Avail yourself of the benefit of their experience.

C. Locality

In general, it may be said that turkeys are grown successfully in practically every part of the country, as they stand both heat and cold and high and low altitudes, provided they are given adequate seasonal shelter from winter weather, dampness, and summer heat.

Raising Turkeys on the Range (Contd.)

Turkey projects are being conducted in small towns, in the vicinity of large cities, in remote rural areas; on general farms and on large farms where flocks of from 5,000 to 60,000 are grown.

The important areas of production now are the Middlewest, the Pacific Coast, and the Middle Atlantic States, where turkeys are raised for the most part on the open range.

D. Housing

There are many different styles and types of housing that turkey growers have found to be convenient and adequate for their use. Anyone contemplating going into the business should consult the county agricultural agent for advice regarding appropriate housing for that particular area. He should also write the poultry division of the Agricultural College in his State, and the Bureau of Animal Industry, U. S. Department of Agriculture, Beltsville, Maryland, for information and drawings to use as a guide in planning the purchase or construction of housing.

Frequently, there is unused space in a barn, garage, or other outbuilding that may be remodeled for storing feed or brooding poults; therefore, eliminating the cost of erecting new and expensive quarters. Regardless of the building utilized or the space occupied, the feed supply, brooders, and rearing pens should be arranged in such a manner as to eliminate unnecessary travel and retracing of steps in the process of the daily work.

Feed should be stored where it is dry and protected from contamination by rats and other rodents, because molded feed causes many illnesses in turkeys and all rodents are carriers of disease. The storage space required will depend upon the availability of the feed and frequency of delivery. A small storage space of approximately 100 square feet is a convenient size for most projects.

1. Brooder Houses

The following information was taken from "Turkey Management" by S. J. Marsden and J. H. Martin.

Elaborate housing is not required anywhere in the United States for successful turkey management. During the brooding period when birds are raised artificially, all that is needed is a brooder house that can be heated to a floor temperature of about 70° F.

Raising Turkeys on the Range (Contd.)

In warm climates the construction may be cheaper than in cold climates. Turkeys brooded in advance of the normal season may require better housing than those brooded in the normal spring season. The general principles of brooder house construction for all kinds of poultry may be applied to turkey brooder houses. A warm dry floor, ample light, sufficient ventilation, protection from vermin, tight walls, and a roof that will retain the heat and protect against the weather, are the requirements. Interior fixtures required are: Brooder, roosts, water fountains, feeders, wire-covered platforms for feeders and waterers, and litter or wire floors.

Portable brooder houses are constructed of wood or composition board and placed on skids. If use in subfreezing temperature is contemplated, the floors should be double-boarded with building or tar paper between the layers. The walls are usually single-boarded with tight-fitting material. The roof is commonly made of boards and composition roofing, or less frequently, of metal or plywood. A house 10' by 12' or 9' by 14' is satisfactory in size. Brooder houses much larger cannot be moved readily and houses much smaller are not economical. These sizes will carry about 180 poults for the first 8 weeks.

## 2. Housing During the Rearing Period

Practically all turkeys raised in the United States are without overhead shelter after the age of 8 to 12 weeks. The roosts are merely set up in the open. Protection is afforded by watch dogs, guards, fences, lights; and shade is provided by natural or other means. However, the use of range houses is increasing and prefabricated range shelters are now on the market.

The features desired in a range shelter are: a reasonably tight roof that will shed most of the rainfall; protection from prevailing winds that bring cold, snow, or rain; protection from all predators; properly constructed roosts; sanitary conditions; and good ventilation.

These advantages may be provided by a simple shelter constructed of wood, wire, and roofing. The type of construction which will best meet the needs of growers will depend upon the method used in ranging turkeys.



Raising Turkeys on the Range (Contd.)

There are two types of range rearing: (a) limited range or semi-confinement, and (b) open range.

a. Limited Range

This type involves the use of fully or partially fenced areas large enough to provide growing feed. An outstanding example is the so-called "Minnesota Plan" which is now widely used all over the country. This plan consists of moving the birds and rearing equipment once each week to an adjoining clean area of a large field. Range shelters built on skids with roosts under the roof are desirable in most situations. They furnish roosts, shade, and protection from weather. Shelters 10' by 12' to 10' by 14' furnish roosts, shade, and protection from weather for 100 to 130 turkeys each.

Some suggestions to be considered in the building of range shelters are:

(1) Roofs

Galvanized roofing makes a satisfactory and economical roof in almost any climate. If the sheathing is tightly boarded underneath to prevent wind damage, roofing paper makes a good type of cover for shelters. In localities where lumber is available at reasonable cost, over-lapping boards make a fairly good roof. Where growers have access to such things as brush, marsh hay, straw, or corn stalks, they may be used to make inexpensive but satisfactory roofs.

(2) Walls

Woven wire, studding, and a few boards usually make up the walls. Studding may be of 2" x 2" material in low-eaved portable buildings; 2 x 4's or poles are used in buildings with high eaves. Wire for side walls should be as follows: Where walls are 3' in height, the wire should be strong, of 1-1/2" hexagonal mesh, 16-gauge, or 1" hexagonal mesh, 18-gauge, tightly fastened to exclude dogs; where not within reach of dogs, less expensive wire of 1-1/2" or 2" mesh, 18-gauge, may be used.

Raising Turkeys on the Range (Contd.)

## (3) Floors

Range-house floors must be strong, durable, and sanitary. The top of the floor should be at least 16" above the ground or other surfaces which receive droppings that fall through the floor. Wire netting, sufficiently strong to keep birds from crawling beneath the floor and eating the droppings, should be used to enclose the entire outer surface of the range shelter from the floor to the ground. The following floor materials are satisfactory: 1" to 2-1/2" wide wooden slats painted with creosote or crankcase drainings and placed flatwise 1" to 1-1/2" apart, or on edge 1" apart; 1-1/2" mesh, 16-gauge, hex-weave wire; 1" x 2" or 1" x 4", 11- to 12-1/2-gauge electric weld wire; 1-inch 12- or 14-gauge hardware cloth, or welded wire floor sections. The 3 types of wire are nailed to removable wooden frames of 2" x 4" material on the outside, and 1" x 4" pieces on the inside. The top of each 2" x 4" should be beveled to prevent an upper surface of only about 3/4". The wire is only nailed to the 2" x 4" framework, not to the 1" x 4" center supports. A strong 1" or 1-1/2" staple or 8-penny nail is used to fasten the wire.

## (4) Roosts

Poles 2" to 4" thick or half round 2 x 4's make the best roosts. For Broad Breasted Bronze they should be set level, but for other types of turkeys they should be tilted at a 15- to 20° angle. In general, the high side of the roost should be placed toward the prevailing wind. In most cases, step ladder roosts are better than roosts all placed on the same level, because the birds can go to roost in a more orderly manner. Roosts should be placed 20- to 24" apart on center (center to center); for large-type turkeys 24" are preferred. The last roost should be placed 18" to 2-1/2' from the ground or floor. Low roosts built in the open, all on the same level, about 8- to 14" from the ground, are becoming popular. There is no advantage in high roosts. Allowing no roosts at all beyond the brooding stage is considered best for the Broad Breasted Bronze.

Raising Turkeys on the Range (Contd.)

## b. Open Range

Several methods of open range rearing are in use. Herding consists of keeping the birds in the flocks under control during the daylight hours and seeing that they assemble and roost together in a group at night. This is usually accomplished by a herder on horseback or on foot, and dogs that have been trained to assist without injuring the birds. Camping facilities such as a wagon, automobile trailer, or a tent that can be moved readily from place to place are usually provided for the turkey herder. Lights, particularly road flares, gasoline torches, and kerosene lanterns are often set up at night to keep off coyotes and other predatory animals. Portable roosts, feeders, and watering devices are usually used.

In the small-unit range plan, the poults are reared in groups of 200 to 500, scattered well apart over a large range area. The birds within a group are of the same age. A simple shelter is used, sufficient in size to protect the poults from the time they are put on range until they are about  $3\frac{1}{2}$  months old. Roosts are then set up near the shelter, and a portable corral of ordinary heavy weight poultry fencing is set up around the shelter, roosts, and feeders at night to give protection from predators. Additional protection afforded by dependable watch dogs, or a night guard, is almost always necessary. Ad libitum feeding is practiced under this plan. If the poults are not full-fed, the various flocks will intermingle unless they are placed long distances apart. With full-feeding, the units may be placed as close together as 500 yards, the distance depending upon the terrain and the nature of the vegetation. Each unit usually remains in the same place for the season, but may be moved if disease or range conditions warrant. If properly carried out, either plan provides excellent growing conditions.

Another method of open range rearing, consists in the use of islands and peninsulas to provide natural boundaries and a bountiful supply of water, unless it is salt water. However, as noted elsewhere, trouble with parasites is frequently encountered when turkeys have access to natural supplies of water such as lakes or streams. On account of this, the use of water as a means of confinement and for the turkeys to drink is not recommended.



Raising Turkeys on the Range (Contd.)

## 3. Fencing

Rectangular-mesh poultry fencing 5 feet high is generally used for confining growing turkeys. Regulation 58-inch poultry and rabbit fence is quite satisfactory. Six foot wire is recommended for yards that are small or narrow, such as brooder house yards, and for yards located on hill-sides. In long narrow yards, birds have a tendency to fly lengthwise of them and then over the fence. On hilly terrain the birds will fly down hill especially on windy days when they utilize the force of the wind to "take off."

On rigid-top gates and on buildings that are about 9 feet in height, antilflies must be placed to prevent birds from alighting on them and getting out of their yards. Antilflies are made of junior weight rectangular mesh poultry wire supported by 2" x 2" boards or by sections of light weight angle iron nailed or wired to the buildings, gates, or fences.

Fencing with top and bottom wires, 11- to 12 $\frac{1}{2}$ -gauge, and center wires, 14 $\frac{1}{2}$ - to 15 $\frac{1}{2}$ -gauge, is advisable. Stays should be 4 to 6 inches apart. In damp climate the best available rust-proofing is economical.

Steel posts are in common usage except where wooden posts are very cheap. For use in climates of high humidity, steel posts should be galvanized. Five-foot fencing requires 7-foot line posts and 8-foot gate and corner posts, while 6-foot fencing requires 8- and 9-foot posts, respectively. The line posts may be set a rod apart under ordinary conditions. In very loose soil or where conditions make especially heavy demands on the fencing, the spacing is best reduced to 10 or 12 feet. Special conditions may also necessitate setting the line posts 2 $\frac{1}{2}$ - to 3-feet in the ground instead of 2 feet. In ordinary firm soil and for the comparatively short stretches usually involved in poultry fencing, dirt-set corner and end posts are satisfactory. They are much cheaper to install and can be moved when necessary. Cement-set posts are required in soft earth and are preferable where long stretches of fence are required.

Fencing for permanent brooder house yards should be provided with baseboards close to the building and these should be placed close to the ground at all points. For older birds, it is necessary only to place the fence on the surface. Tight stretching is very desirable, however, in all cases.

Raising Turkeys on the Range (Contd.)

Gates should, in general, be the same height as the fences. In locations where they must be opened and closed frequently, a strong, rigid gate, preferably one with steel frame, is required. Electric fences are not suitable for confining turkeys, as they do not restrain the birds satisfactorily and tend to cause burns.

#### 4. Minimum Requirements for Range Equipment

The method of operation used by turkey growers will determine the type of equipment needed. However, the minimum essentials for all projects will include:

##### a. Roosts

Poles 2" x 4" thick or half round 2 x 4's placed 24" apart make the best roosts. Low roosts built in the open and on the same level, about 8- to 14" from the ground, are becoming popular. Allowing no roosts at all beyond the brooding stage is considered best for the Broad Breasted Bronze. Following is an example of a convenient and inexpensive, portable roost: The running gears of low-wheeled wagons are used and several wagons may be trailed at one time. A frame constructed of 4" x 4" material is built lengthwise of each wagon and fits on the front and back bolsters. Cross members, poles, or half round 2 x 4's, extending a few feet beyond the edge of the frame on each side, are placed at tight angles, and at 24" intervals over the entire length of the frame. Two by four posts extend from the four corners of the frame to the ground to prevent the roosts from tipping from the weight of the turkeys. These posts are removable or they may be hinged, so that they can be folded up out of the way when moving. Additional roosts may be added by leaning 4" x 4" supports from the side rails of the frame to the ground, and placing poles or half round 2 x 4's, 24" apart, at right angles to them. Such roosts are easily lifted and slid onto the wagon for quick and easy moving.

##### b. Feeders

When feeding is done under shelter, trough feeders are suitable. No cover is necessary, but a guard to prevent contamination should be installed. Trough type feeders are usually satisfactory for outside feeding. However, in climates having heavy rainfalls, shelters should be provided to prevent serious wetting of the feed. Large hopper type feeders built on skids require less labor in

Raising Turkeys on the Range (Contd.)

distributing feed and are coming into wide usage. There should be a minimum of one 10' feeder or 20 lineal feet of feeding space for each 100 birds. This type of feeder is not difficult to construct and anyone having a reasonable amount of mechanical skill will be able to build most of his feeding equipment and save considerable expense.

c. Waterers

A tank wagon is a common method of hauling to range. Troughs are frequently built on skids and may be made of metal or wood. There should be a minimum of one 10-foot trough waterer, or its equivalent, for each 250 birds. Regardless of the size, shape, or style of trough used, there must be some protection to prevent the water from becoming contaminated. An effective method is to fasten a reel directly above the trough. This will prevent turkeys from attempting to cross over to the other side of the trough. Another method is to have a trough completely covered. Slots in the side and near the top permit the turkeys to drink, and a float fastened to the valve in the storage tank keeps the water level adequate to supply the turkeys at all times.

E. Selecting a Variety

There are two classifications of turkeys, the Standard, which is a large bird, and the Non-Standard, which is considerably smaller. The variety should be chosen on personal preference, market trends, and general adaptability to each situation; and the strain possessing the characteristics best suited to the purpose, for which the turkeys will be used, should be selected.

Six standard varieties, popularly called breeds, of domesticated turkeys are recognized by the American Poultry Association, an organization having as its primary function the standardizing of varieties of poultry in North America. The Association publishes the Standard of Perfection, which contains descriptions of breeds and types of poultry.

1. Standard Varieties

The Bronze.—The Bronze is the heaviest standard variety; toms weighing approximately 22 pounds, and hens 13 pounds at market age of 28 weeks. Its skin is creamy white, or yellowish white if pigment-producing feeds, such as yellow corn, are eaten in large quantities.



Raising Turkeys on the Range (Contd.)

The White Holland.--The White Holland is medium in size; toms weighing approximately 20 pounds, and hens 12 pounds at market age of 28 weeks. It originated from the Bronze or the wild turkey; its skin is white or yellowish white.

The Bourbon Red.--The Bourbon Red is medium in size; toms weighing approximately 20 pounds, and hens 12 pounds at market age of 28 weeks; its skin is white or yellowish white.

The Narragansett.--The Narragansett is a medium-sized variety; toms weighing approximately 20 pounds, and hens 12 pounds at market age of 28 weeks. The skin is white or yellowish white as in the other varieties. Young Narragansett poults resemble Bronze poults and cannot be distinguished from them.

The Black.--The Black is a medium-sized variety; toms weighing approximately 20 pounds, and hens 12 pounds at market age of 28 weeks. It is known in England as the Norfolk turkey. The skin is white or yellowish white.

## 2. Non-Standard Varieties

The great majority of turkeys now raised in the United States are the non-standard varieties, the Broad Breasted Bronze and the Beltsville Small White being outstanding examples.

The Jersey Buff.--The Jersey Buff is medium small in size; toms weighing 13 to 18 pounds, and hens  $8\frac{1}{2}$  to 11 pounds at market age of 24 to 26 weeks. It was developed through pedigree breeding and selection from crosses of Black, Bourbon Red, and Broad Breasted Bronze at the New Jersey Experiment Station, Millville, New Jersey; and is about 10 percent heavier than the Beltsville White at all ages. The light-colored pinfeathers are inconspicuous in the dressed bird.

The Beltsville Small White.--The Beltsville White is a small turkey; toms weighing 12 to 17 pounds, and hens  $7\frac{1}{2}$  to 10 pounds at market age of 24 to 26 weeks; also about  $1\frac{1}{5}$  to  $1\frac{1}{4}$  more turkeys may be raised with the same equipment and labor. This variety was developed by poultry scientists at the experiment farms of the United States Department of Agriculture, Beltsville, Maryland. It is identical in color with the White Holland but is smaller and is fast becoming popular with the buying public. It has a compact body, long keel bone, and abundant meat on breast and legs, and is suitable for small families and small ovens. Its white feathering is a further asset since white pinfeathers, when present, detract less than dark ones from the appearance of dressed birds.

### Raising Turkeys on the Range (Contd.)

The Charlevoix.—The Charlevoix is a small type Bronze about the size of the Jersey Buff; toms weighing 13 to 18 pounds, and hens  $8\frac{1}{2}$  to 11 pounds at market age of 24 to 26 weeks. It originated in Canada and is raised in limited numbers in that country.

The Royal Palm.—The Royal Palm is a new variety about the size of the Jersey Buff; toms weighing 13 to 18 pounds, and hens  $8\frac{1}{2}$  to 11 pounds at market age of 24 to 26 weeks.

The Broad Breasted Bronze.—The Broad Breasted Bronze, although a non-standard variety, is a large turkey; toms weighing 22 to 24 pounds; hens 14 to 15 pounds at market age of 24 to 26 weeks. It is most extensively used of all varieties; is distinctive for its body type; and yields about 6 pounds more of all lean meat per hundred pounds than other turkeys.

Of all these varieties the Broad Breasted Bronze, standard-bred Bronze, and crosses between them are by far the most popular, probably together comprising 90 percent of the turkeys in the United States.

All sizes and varieties of turkeys can be raised successfully and profitably on the range. However, the smaller varieties are winning favor with many growers; a larger number can be raised in a given space; they can be marketed as broilers in 14 weeks and mature as roasters in approximately two weeks less time; they meet the demand of small families and small ovens; and there is a market differential of from 5 to 15 cents a pound in their favor.

Persons desiring information and advice pertaining to the selection of a variety, which is most suitable for their purpose, should communicate with the county agricultural agent in the community where they are going to operate; describe the system they intend to use in raising turkeys; tell whether they plan to market live or dressed turkeys; and explain whether they intend to sell direct to the consumer or to the wholesale trade. With this background of information, the county agricultural agent will be able to give practical advice concerning the variety best suited for the type of project to be undertaken.

## F. Care of Turkeys

### 1. Brooding

The following information was taken from "Turkey Management" by S. J. Marsden and J. H. Martin.

A satisfactory brooding device should provide the following:

Raising Turkeys on the Range (Contd.)

The temperature near the center of the hover, one inch above the floor, should be 100° F. Near the floor, at the edge of the hover, 95° F. is desirable, and the floor temperature of the room should be kept at about 70° F.

Uniform heat regardless of outside temperature.

Controllable heat that can be adjusted to the demands of the birds at various stages and under varying weather and management conditions.

Safety from fire.

Ventilation under the hover and in the brooder room, sufficient to avoid wet litter and also meet the requirements of the poults for fresh air.

Reasonable first cost and reasonable operating cost.

Heat may be supplied by coal, wood, oil, gas or electricity, the choice depending partly upon the relative cost and availability of the various fuels.

It would be well for growers to consult the county agricultural agent in the community, where they will operate, for advice as to the type of brooder best suited for their purpose.

A practical brooding unit is about 150 poults. Many operators brood from 180 to 250 or even 300 per unit, but it is better practice and less risky to limit the brood to 150. About 1 square foot of brooder-house floor, or floor and porch space, should be allowed per poult if the birds are to be brooded for about 8 weeks.

Brooding time (1 day to 8 weeks) is a critical period for turkey growers, as the start turkeys get largely affects their future development. They must be kept warm, dry, free from draft, have good ventilation, be fed well-balanced rations, be carefully watched to make certain they learn to eat and drink properly, and the brooder house must be kept clean and sanitary at all times.

Many kinds of litter, such as straw, shavings, peanut hulls, shredded cane, and sand are used with varying degrees of success. However, wire floors remove the need for litter and are a help to disease control. Where wire floors are used, sufficient space between the wire and the floor should be allowed for adequate ventilation.



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Compared to chicks, poults are more difficult to brood. They do not learn to eat so rapidly; they are more subject to fright, crowding, and piling; they do not take kindly to changes in feed or equipment; and they are more easily chilled. The essentials of success in poult brooding are good equipment and eternal vigilance. Overcrowding is very dangerous, and large units, over 175 poults, are more difficult to handle than small units. Ample feeding and watering space and sufficient heat must be provided. Getting the poults out into the sun-porches or yards is good practice, but it must be done carefully and the poults watched continuously. If quick and easy access to the brooding room and to the brooder itself is not provided, the poults may crowd together in the corners of the porch next to the house. Boards or wire may be used to guide the poults back into the house openings.

## 2. Feeding

Feed should be kept before turkeys constantly from hatching to market age, and should be put in hoppers or troughs; not on the floor, or ground.

For the first 24 to 72 hours after hatching, poults can live without feed or water, the yolk of the eggs which they have absorbed before hatching being sufficient to maintain them for that length of time. However, the sooner they are fed, the better; and in any event, they should be fed as soon as they are put into the brooder house, in order to prevent excessive eating of the litter. Poults kept from feed and water for more than 24 hours after hatching learn to eat and drink with difficulty. It is common practice to see that the poults are fed and watered within 24 hours after hatching.

The first feed may be starting mash or crushed pellets (granules) upon which is scattered a little oatmeal or tender, finely chopped green feed. These materials should be placed in small heaps on clean boards, pie plates, or cup flats underneath the hover for the first day or two. Pelleted mash may be fed after the first 3 or 4 weeks, but poults do not take well to it at the start--they seem to prefer dry mash or granules. The feeding of liquid milk is not recommended for poults.

Although finely chopped tender green feed is good for poults in guarding against nutritional deficiencies and encouraging them to eat, feeding it is usually impractical due to labor costs and difficulty in obtaining suitable types. Most turkey growers prefer to feed a complete starting mash so as to eliminate the necessity of feeding green feed.

Raising Turkeys on the Range (Contd.)

Poults that will not or do not learn to eat and drink quickly may be saved by force feeding. Make a soupy mixture of regular starting mash with water or milk. Take the small end of a 25-cubic centimeter glass laboratory pipette in the mouth, and by suction fill the pipette with the mixture. Open the poult's mouth, insert the large end of the pipette down the poult's gullet beyond the entrance to the lungs, then force out enough of the food to fill the crop comfortably. One such feeding usually is enough but two or more may be needed in stubborn cases.

Starting mash is recommended for feeding turkey poults during the first 8 weeks. This mash is a complete feed, needing no supplements except water and insoluble grit, such as granite, mica, coarse sand, or gravel, which may be hand-fed lightly on top of the mash.

Diets for growing poults after 8 weeks of age generally include both mash and grain. Oats are a good fattening feed and usually are palatable to turkeys. Turkeys intended for fryers should be fed the mash and whole heavy oats starting at 6 to 8 weeks.

Practically all turkeys raised in the United States are placed on the range and raised without overhead shelter after the age of 12 weeks. In this type of rearing, the environment is expected to furnish vitamin D factor through direct sunshine; make it easier to provide a well-balanced diet; and make a substantial contribution to the diet (about 25 percent of the feed consumed) in the form of growing green feed, from insects, stubble fields, and rice paddies.

When growing turkeys, past the brooding stage, are allowed free access to growing or naturally cured green feed of almost any type that they will eat freely, there may be little fear of the vitamin requirements being satisfied.

Two types of range rearing as follows are used:

a. Limited Range

This involves confinement of the birds to moderate sized and fenced range lots, although there may be an unlimited area of range available.

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When the birds stay on the same area for periods longer than a month, an acre will provide green feed for 50 to 300 birds, depending upon the nature of the vegetation. If, however, the Minnesota Plan which requires a 4-year range rotation is used, an acre would be required for each 50 turkeys. Where a 3-year rotation plan is used, one acre would be required for 67 turkeys.

Permanent crops are desirable. Where there is sufficient rainfall, good results have been obtained from pastures consisting of alfalfa, Bermuda grass, Ladino clover, and other legumes. When it is not possible to grow permanent pastures, such crops as wheat, rye, barley, buckwheat, and sunflowers make good turkey range. In sections of the country where there is little rainfall, various other crops such as blue grass, vetch, cowpeas, fall-rye, and rape are all good forage plants for turkeys.

Local and State agricultural authorities are best qualified and willing to advise regarding pasture and management best suited for the particular area in which the turkey grower is to operate.

b. Open Range

Open range involves the use of a very large range area. There are two types of open range rearing which are compatible with good business principles:

- (1) The fencing of large areas of land suitable for ranging turkeys; and
- (2) The herding of turkeys to provide continuous protection and to prevent straying. Allowing the turkeys to roam at will without liberal feeding is unsatisfactory.

From 9 weeks to marketing, both the growing mash and hen sized scratch grain (no whole corn until the 16th week) are fed ad libitum.

Following are examples of balanced rations which are suitable for turkeys on either limited or open range.

Growing mashes Nos. 1 and 2 are for flocks having continual access to good green range. In mash No. 2, soybean meal



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which has proved to be a good source of protein and also good for fattening, is substituted for meat scrap.

Growing Mash No. 1	Parts by Weight
Ground yellow corn or barley.....	25
Ground oats or grain sorghum.....	25
Wheat Middlings or shorts.....	20
Meat scrap, 50 or 55 percent protein.....	19
Wheat bran.....	10
Salt, fine sifted.....	<u>1</u>
Total.....	100
(Estimated crude protein, 19 to 21 percent)	

Growing Mash No. 2	Parts by Weight
Ground yellow corn or grain sorghum.....	30
Ground oats or ground wheat.....	30
Soybean meal.....	30
Steamed bonemeal.....	6
Ground oystershell or limestone.....	3
Salt, fine sifted.....	<u>1</u>
Total.....	100
(Estimated crude protein, 20 to 21 percent)	

The mash formulas suggested are only a few of many combinations of ingredients. Growing mashes may be made of other combinations of grains, grain by-products, protein feeds, and vitamin supplements, the exact composition depending largely on availability and cost of ingredients. It is best to use two grains, and preferably three or four in a total diet.

Oats usually are very palatable to turkeys, hence are best fed mixed or free choice with one or two other grains to prevent excess consumption of oats. To a great extent, cost and availability of the grains determine the kind of grain fed, as the grains all have about the same value in turkey growing and fattening diets. Oats, common barley, emmer, spelt, rough or paddy rice, buckwheat, and proso, due to their higher fiber content, are worth 80 to 85 percent as much per hundred pounds as corn, wheat, rye, hullless barley, brown rice, and sorghum grains, but when this difference in digestible nutrients is allowed for, they are just as good for growing and fattening purposes.

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Free choice feeding of two or more grains is good practice and does away with mixing, an advantage especially where home produced grains are fed.

Turkeys should be fed as much mash as they will clean up each day. Wet feed of any kind, when allowed to remain in the feeders, will soon sour. In sections of the country where rainfall is heavy, feeders should be covered to prevent the feed from becoming wet and contaminated by souring. Convenient feeders for range use are described under "Housing," page 54.

Water.—Water makes possible the processes of digestion and absorption, transports waste products, softens feed, and cools the body by evaporation in air sacs and lungs. It makes up about 59 percent of the edible parts of dressed, fat turkey males, and 54 percent of females. All feed contains some water, but the principal sources are fresh green feed, liquid milk, and the water supplied for drinking. Water should be supplied freely to all classes of turkeys at all times, except in some instances when liquid milk is fed. Dirty, very cold or hot water is to be avoided. Waterers and methods of supplying water for turkeys on the range are described under "Housing," page 55.

Records of feed consumed each day by large and small turkeys over a period of 24 weeks, show that 4 to 6 pounds are required to produce one pound of turkey meat; also that turkeys raised on the range obtain substantially 25 percent of their feed from insects, grasses, waste from grain fields, and rice paddies, thus creating a saving in the purchase of feed. Where home grown grains are available, additional savings are made. During the last few weeks before marketing, turkeys should not be moved long distances or subjected to radical changes in management or feeding, as this might slow down the finishing process and even result in the loss of weight.

### 3. Cleaning

The following information was taken from "Turkey Diseases" by Hinshaw & Rosenwald; "Turkey Raising" by Marsden; and "Turkey Management" by Marsden & Martin.

Keeping housing and equipment clean and sanitary is the keynote to success for all turkey growers. Brooder houses should frequently be cleaned, scraped, swept out, and then scrubbed, using water (preferably hot) containing a 13-ounce can of lye to 13 gallons of water. Reliable disinfectants such as coal tar products, i.e., cresol solution, may be sprayed on the floor and sidewalls. All equipment used for brooding should first be cleaned thoroughly.

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All litter, including droppings, should be hauled to a place where turkeys cannot reach it. Infection and fly trouble can be reduced by composting or spreading the litter in the sun away from turkeys.

All movable equipment should be removed to a cement run or a cleaning platform.

The walls, floors, and built-in equipment should be scrubbed with lye solution (1 can, or 13 ounces to 20 gallons of water). Apply with an old house broom. Care should be taken by the worker not to get solution on hands, face, or clothes. Vinegar is an antidote. Time should be allowed for thorough drying before poults are put in the house. Lye is too corrosive to use a spray on plaster or concrete, but is excellent for disinfecting wooden or metal (except aluminum) equipment.

Feeders and waterers should be made contamination-proof. All feed and water pans should be on wire platforms or on wire floors, if practicable. The area around water pans should always be dry. All waterers should be kept clean by daily washing with brush or cloth followed by rinsing in clean water. Occasional disinfecting with chlorine or quaternary ammonium disinfectants, sodium orthophenylphenate solution, or other disinfecting solution not leaving a strong odor, may be used if disease is present. However, cleanliness alone usually is sufficient.

Feed troughs must be protected from contamination by keeping them covered with wire or slats having openings sufficient to permit turkeys of various ages to eat. They should be hung high enough from the floor so that the feed will not become contaminated with litter or droppings. Sour feed should never be allowed to remain in the feeders, and receptacles for milk should be washed and scalded daily. For poults only a few days old, feeders will be of wood strips similar to house laths or flat metal receptacles such as pie plates. The wood strips should be disposed of and replaced frequently, and the metal receptacles sterilized daily.

If no disease is present, feeders may be put on a cement floor or cleaning platform, washed with soapy water, and dried thoroughly in the sun.



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If a disease is present, feeders should be washed in soapy water and rinsed; then rinsed thoroughly in boiling water and sprayed with live steam or dipped in a 1 percent solution of formalin; or sprayed with, or dipped in sodium orthophenylphenate or a quaternary ammonium compound, diluted as directed on the package.

Be sure to disinfect equipment, shoes, and overshoes, which have been used in a contaminated pen before entering a clean compartment; or, after they have been used in a pen of older poults before using them in a pen of younger ones. Apply one of the general disinfectants (lye solution, sodium orthophenylphenate, compound solution of cresol, sheep dips).

The wire or slatted floors of rearing pens and all roosts should be kept thoroughly clean; and may be washed down with a garden hose, and scrubbed with a stiff broom or brush, when necessary. All droppings beneath the floor of the pens should be removed at close intervals and disposed of by spreading in the sun to dry or be decomposed in a compost pit or caoinet.

Feed storage houses should be dry and rodent-proof, to prevent illness among turkeys. Cleanliness alone will not eliminate illness or disease in a flock of turkeys, but it will do much to prevent trouble. Growers must expect a certain amount of disease and mortality, but it is better to prevent and control an outbreak in a flock than to try to cure sick turkeys. Diseased birds should be sent to the laboratories of the State experiment farm for diagnosis. The services are free and there is no excuse for guesswork. Dead birds should be disposed of by burning to prevent spread of disease.

#### 4. Feather and Flesh Picking

Feather picking is a mild form of cannibalism to which turkeys are very susceptible during the growing period, especially after they are about 12 weeks of age. It results in unsightly appearance, and more trouble from pinfeathers when the birds are marketed.

There is little trouble from feather picking when turkeys are raised on the range. However, if the trouble does arise, it may be prevented, or stopped completely, by "debeaking," or by a specially made turkey bit resembling a 1-1/4 inch hog ring hanging between the two jaws and adjusted to fit snugly in the

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nostrils of the turkey without penetrating the septum between them. This device prevents the beak from being closed completely, thus preventing feather picking. The "debeaking" should be done, or the bit applied when the trouble starts, usually at about 12 to 14 weeks.

Management practices that tend to prevent feather picking are: (1) Placing tightly stretched 11- or 12-gauge wire on the feeders for beak-cleaning; (2) providing 3-1/2 to 4 inches of feeder space per growing turkey, rather than the minimum allowance; (3) feeding an adequate diet; (4) feeding whole oats in fairly large proportion--about 50 percent of the grain portion of the standard mash-grain diet; (5) not confining turkeys to roosts or restricted quarters, particularly in the early morning.

Head and neck picking occasionally results from fighting. Fighting usually is not serious among turkeys raised on the range, as the injured birds have ample opportunity to escape.

Pine tar or chick-pick remedies, such as a mixture of 4 ounces of petrolatum, one-fourth ounce of carmine, and one-fourth ounce of aloes applied to the affected area, offer temporary relief from picking.

#### 5. Diseases, Pests, and Common Ailment

Information on this subject was obtained from Farmers' Bulletin No. 1409, "Turkey Raising," and Farmers' Bulletin No. 1652, "Diseases and Parasites of Poultry;" "Turkey Management" by Marsden and Martin; and "Starting Right with Turkeys" by G. T. Klein.

At the slightest indication of disease, turkey growers should consult the county agricultural agent for advice; and, irrespective of sight, the services of a veterinarian should be obtained, since the diagnosis and treatment of disease require special knowledge, skill, and experience.

The best way to fight disease in turkeys is by prevention and control, not by trying to cure sick birds. Not too much is known about how to care for a turkey once it gets sick; therefore, growers must expect some mortality.

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## a. Prevention

Prevention is too often thought of only in terms of impractical cleanliness. In practice, no one expects the poultry house to be spotlessly clean and free from germs; and cleanliness alone, although vitally important, will not prevent all disease.

Listed are some of the weapons and a plan of action poultrymen can use to prevent and control disease, parasite, and vice outbreaks in their flocks. They were taken from a reliable poultry manual published by a manufacturer and distributor of poultry feeds and insecticides. Each has its important place in the practical disease control program, and includes:

## (1) Seven Weapons to Combat Disease--

- |                              |                  |
|------------------------------|------------------|
| (a) Blood testing breeders   | (e) Vaccines     |
| (b) Common sense cleanliness | (f) Insecticides |
| (c) Complete nutrition       | (g) Drugs        |
| (d) Mechanical devices       |                  |

## (2) A Plan of Action to Keep Disease and Mortality at a Low Level--

- (a) Buy poults from a hatchery having pullorum-free breeding stock only; a sound sanitation program; and one that controls breeding flocks supplying its hatching eggs.
- (b) Get poults in new boxes and use feed from new bags.
- (c) Keep brooders and laying houses clean and dry.
- (d) Allow no mudholes, piles of trash, boards, or manure around poultry houses.
- (e) Keep unnecessary visitors out of poultry houses.
- (f) Don't wait for a seriously sick poult to die--get rid of it at once.
- (g) Burn or bury all dead birds immediately.
- (h) Keep poults away from growing turkeys.



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- (i) Vaccinate against fowl pox, Newcastle disease, and bronchitis if they are a threat in the area.
- (j) Keep poultry houses free of lice and mites.
- (k) Rats, insects, and wild birds should be kept out of poultry houses.
- (l) Use drugs where they effectively help prevent or control disease. Remember, no drug is a "cure-all."
- (m) Feed is important in any disease prevention program. Follow the recommended feeding program that fits the needs of the flock so the birds will be fortified with good health that comes from complete nutrition.

## b. Common Diseases

In this section is listed some of the most common diseases, pests, and ailments affecting turkeys. Each is described according to its nature, symptoms, cause, and method of treatment.

Blackhead.--Blackhead is primarily an infectious disease which attacks the ceca and liver of turkeys; and may occur at any time in the life of a turkey, but is most serious in young birds. The fact that the head of the affected bird may become discolored has given it its popular name, blackhead.

Symptoms--Drooped wings, drowsiness, ruffled feathers, weakness, loss of weight, and sometimes a sulphur-colored diarrhea are the main symptoms. Death is often sudden. The discoloration of the head is seen also in other diseases and is not always present in this disease, so that the term "blackhead" is not a very satisfactory one. Post-mortem examination will show the liver to be enlarged and often spotted with dark red, gray, or yellow circular areas.

Cause--The parasite (*Histomonas Meleagridis*) causing blackhead is one of the protozoa. The organisms live part of the time free in the cavity of the ceca or blind pouches; but in another stage of the disease, they apparently enter the walls of the ceca and are probably carried through the blood stream to the liver. The organisms in the ceca multiply in large numbers and pass

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out in the droppings. When the eggs from the droppings are eaten, in contaminated feed or water, and hatch in the intestinal tract, the blackhead organisms are transmitted to the bird and set up the disease.

Treatment---Although many drugs have been tried and some are recommended for the treatment of blackhead, none have been found to be of practical use. Control measures to prevent development of the disease is the only practical procedure.

Complete separation from chickens is of fundamental and paramount importance. Clean ground must be provided at all times. To avoid soil-borne diseases, the turkey grower should provide: Land not used by poultry for two years or more; land not contaminated by drainage water or poultry manure; land well separated from previous range; land naturally well drained; range consisting of grass, ladino clover, alfalfa, or other good pasture; areas around waterers kept dry; feeders moved to a clean spot each week; and prevention of transfer of contamination by visitors, animals, vehicles, etc.

Coccidiosis---This disease is less severe in poults than in chicks, and if observed in time can be checked with less setback to the flock. Coccidiosis makes its appearance in poults from 5 to 16 weeks of age, although occasionally as early as 3 weeks. It is more common in poults, naturally brooded, as the mother hen serves as the source of infestation. The species which infect turkeys are different from those commonly troublesome to chickens, so cross-infection does not occur.

Symptoms---Drooped wings, ruffled feathers, listless appearance, diarrhea light brown and mucoid rather than bloody, although blood occasionally appears as the disease continues to run its course.

Cause---Infestation with parasitic organisms especially of the genus *Eimeria Meleagridis*, a one-celled protozoan. The organism multiplies in the bird's body, so that considerable numbers of the parasite are later passed in the droppings. As a result the infection is spread to other birds. The organisms may be carried or spread by flies, birds, insects, rats, and mice.

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Treatment--The drugs sulfagaunidine or sulfamethazine recently have been found to possess curative properties. It is administered at the rate of 0.5 percent in the dry mash for two or three consecutive days, water but no other food being given. This treatment is sometimes given as a preventive, during the fourth or sixth weeks of brooding, in situations where coccidiosis threatens the flock.

Pullorum.--Pullorum is a destructive, typically diarrheal disease, formerly called bacillary white diarrhea; and is widespread, existing in every section of the United States where appreciable numbers of poultry are raised. The disease is usually acute, with losses up to 30 to 50 percent or more. The most susceptible age is from the first week through the third week, although heavy losses have been experienced as late as three months of age.

Symptoms--Droopiness, huddling together in warm places, ruffled plumage, skin on legs dry and wrinkled, and listless picking at feed. In cases not so acute, there is often a pasting up around the vent and labored breathing which indicates infection in the lungs. The droppings may be whitish, foamy, and sticky.

Cause--The disease is caused by a germ which is known as *Salmonella pullorum*. The organism may be transmitted in the egg or by contaminated feed and water. Although the germ is quite easily destroyed by direct sunlight, heat, or disinfectants, it may remain alive in soil or manure in sheltered places for many days, or even months. The primary seat of pullorum infection is the ovary of the infected hen.

Treatment--The sulfa drugs have been reported as successfully used to prevent death losses from pullorum disease. Pullorum control involves obtaining eggs from disease-free flocks; hatching them in disease-free incubators separately from chicken eggs; and brooding and rearing the poults away from chickens, infected turkeys, and contaminated land or equipment. Blood testing of breeding stock is essential to an effective means of combating the disease.



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Erysipelas.-- This disease, though uncommon, may cause losses in turkeys, mostly males, near market age. It is caused by the swine erysipelas organism, *Erysipelothrix rhusiopathiae* transmitted by sheep or swine.

Symptoms--Listlessness, drooping, aloofness, cyanotic (dark blue) head, nasal catarrh, swelling of the snood which may fall off, and fever of 2 to 3 degrees.

Treatment--Affected birds may be saved by prompt injections of penicillin in proper dosage; 20,000 units of oil, 4 doses given 24 hours apart. Streptomycin (a single dose of 140,000 mcg.) proved 100 percent effective, while 80 percent of the untreated died, in a test by C. C. Grey (1947).

Caution: Erysipelas is transmissible to humans and may cause an itching rash on the skin. Always keep turkeys from contact with sheep or swine, especially where erysipelas has occurred previously.

Newcastle Disease.--Newcastle disease, also known as avian pneumoencephalitis, is a highly contagious virus disease involving primarily the respiratory and nervous systems of domestic fowl. It is characterized by a sudden onset and an extremely rapid spread through a flock. Turkeys are very susceptible. The time between exposure and appearance of symptoms may vary from 2 to 14 days. The average time is generally considered to be about 5 days. The disease may be spread by direct or indirect contact. It may be carried from one farmyard to the next by visitors, such as poultry buyers, feed deliverers, and remedy salesmen. The practice of feed dealers of collecting used feed bags and reusing them causes some outbreaks of the disease. The virus may survive on infected premises for 2 or 3 weeks following an outbreak of the disease; and it is recommended that poultry houses be vacated for at least 30 days before being restocked.

Symptoms--Newcastle disease begins with respiratory symptoms resembling those of infectious bronchitis and laryngotracheitis. The first symptoms observed are difficult breathing accompanied by gasping. Some turkeys emit a peculiar shrill cry which may be heard above the other sounds in a poultry house. The birds are

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visibly depressed and weak. A few days after the respiratory symptoms appear, nervous disturbances are encountered. The birds may lie on their sides, with paralysis of one or both legs or wings. The equilibrium is so altered so that birds may do somersaults, turn over backwards, walk backwards, or twist the head and neck into all sorts of contortions. Tremor of the head is common.

Treatment--Medicinal treatment is of no value in this disease. Approved methods of poultry management should be followed to avoid introduction of the disease into a flock. Recovered birds may become carriers of this disease. Admission of visitors from potentially infected premises should be avoided.

## c. Pests

Lice.--Four species of lice are found on turkeys. The large louse (*Gonoides meleagridis*) and the slender turkey louse (*Lipeurus gallipavonia*), are restricted to the turkey and may be markedly injurious to poults and may also cause severe annoyance to adult birds. The common body lice are found on both turkeys and chickens and may cause considerable irritation to both young and grown birds. The shaft louse may be present, without evident bad effect. High mortality among hen-hatched or hen-brooded poults may result from infestations of head and body lice.

Symptoms--Young poults fail to grow normally, mature birds may be in poor flesh. Lice may be seen easily by examining the upper thigh feathers and the bases of the fluff feathers below the vent. The unhatched whitish louse eggs (nits) may be seen in clumps about the base of the feathers. Some kinds of lice breed on the bird's body feathers, others on the head; young and old lice remain on the turkeys. Lice are yellowish to grayish in color, about 3/16" in length.

Treatment--Apply sodium fluoride among the feathers, working it well down to the skin, one pinch at a time on the head, the neck, the back, under each wing, below the vent, above the vent, and in the long fluff feathers on each side. Baby poults should not be dusted with sodium fluoride or any strong louse powder until more than a week old, and even then the powder should be applied sparingly. If turkeys are roosting in a house,

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lice may be controlled by applying a thin line of nicotine sulphate solution on the top surface of all roosts. Where a general delousing is needed, this method is effective and easily administered. Control of lice involves the destruction of the parasites and nits (1) on the birds themselves, and (2) in the house and litter.

Mites.---Red mites often flourish unsuspected in turkey roosting or nesting quarters, which should be inspected periodically. The presence is indicated by grayish deposits or by the tiny mites themselves, which are red after feeding on the turkey's blood.

Symptoms---Loss of vitality and color indicates a loss of blood due to mites. The scaly-leg mite crawls under the scales of the shank causing the entire shank to appear rough, and the bird sometimes becomes crippled.

Treatment---Paint the underside of the roosts and roost supports with anthracene oil, crude oil, crankcase oil, or any coal tar disinfectant. Make the application light but thorough, and do it preferably in the morning.

Ticks.---The fowl tick, or blue bug, is one of the worst pests of turkeys in the warm sections of the country. It is a large insect resembling a bedbug, and can be controlled by the methods advised for controlling red mites, but the treatment must be thorough and persistent.

Worms.---Turkeys are subject to attack from various species of roundworms, tapeworms, flukes, gapeworms, and gizzard worms. Treatment should not be undertaken until the presence and identification of the worms have been determined by examining the droppings or by post-mortem examination. Worm infestation can be prevented by sanitation and by the control of immediate hosts, such as flies, grasshoppers, beetles, and other carriers.

Symptoms---Loss of weight, sagging wings, paleness, and occasionally diarrhea. However, birds may be fairly heavily infested and yet appear healthy. In most sections of the United States worms do not infest turkeys to any serious extent; yet in a few areas they may be troublesome. The ripened eggs pass through the droppings, incubate in the soil and litter, and soon infest other turkeys.



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Treatment—Four percent of tobacco dust ( $1\frac{1}{2}$  percent nicotine) in the mash, fed continuously, is considered to be an effective control; however, any sanitation program that will avoid trouble from blackhead usually eliminates roundworm infestation. The use of worm remedies without a competent post-mortem examination, to prove the presence of a serious worm infestation, is to be discouraged.

Manson's Eye Worm.—The parasite (*Oxyspirura mansoni*), known as Manson's eye worm, infests chickens, turkeys, and peafowls, and can develop in various wild birds. This worm has an indirect life history, and its intermediate host has been shown by workers of the Florida Agricultural Experiment Station and elsewhere to be a cockroach. The cockroaches are found beneath boards, trash, and in the vegetation at the edges of fences; they feed on whatever food is present, including droppings of the fowl. From the droppings, the cockroaches obtain the eggs or newly hatched larvae of the roundworm, the eggs having been washed down the tear ducts from the eye of the fowl and having then been swallowed and passed in the droppings. The young roundworm develops in the body of the cockroach; and when the roach is eaten by a fowl, the worm is freed in the bird's crop. It passes up the esophagus to the mouth and then through the tear ducts to the eye.

Symptoms—Affected birds wink the eye continuously and frequently attempt to rub the head on the feathers of the wing, or to scratch at the eye with the foot. The eyesight is not good. There is puffiness around the eye and a discharge from the eye and from the nostrils. Often a severe inflammation may result in blindness; at times, the entire eyeball is destroyed.

Cause—The parasite, *Oxyspirura mansoni*, is found under the nictitating membrane, i.e., the transparent membrane which passes over the eyeball of the fowl in the act of winking. The worms are slender, colorless, and about  $\frac{3}{4}$  of an inch long. They can often be detected by a firm pressing of the tear sac at the inner corner of the eye, when they will wiggle out over the eyeball.

Treatment—Two or three drops of a 5 percent solution of butyn should be dropped in the eye as an anesthetic. The transparent membrane should be lifted to place one or two drops of a 5 percent solution of liquor cresolis on the worms. The eye should then be washed well with warm water.

Raising Turkeys on the Range (Contd.)

## d. Common Ailment

Bumblefoot.--Bumblefoot in turkeys is abscesses of the foot pads. The ailment is seldom serious except in Broad Breasted Bronze. Bumblefoot may be confused with Staphylococcosis, a bacterial infection that sometimes causes swollen feet.

Symptoms.--The abscesses have the appearance of corns. They are boil like infections and the bottom of the feet may be swollen. In severe cases the infections look like foot rot in other animals. The birds are lame. Growth is retarded and the weight reduced.

Cause.--The real cause is not known. The probable cause is bruising or cutting of feet followed by an infection. Floors with rough edges and projecting points may result in moderate bumblefoot in all turkeys and serious bumblefoot in Broad Breasted Bronze.

Treatment.--There is no cure for bumblefoot once it develops. If the birds get abscesses, put them in dry, clean quarters and treat the pads with tincture of iodine or an antiseptic healing ointment such as ammoniated mercury or sulfa.

Floors made of poles or slats, having round edges, and roosts low enough to prevent bruising of feet when the birds hop to the floor, have possibilities in the prevention of bumblefoot.

G. Methods Used by Blind Persons in Detecting Signs and Symptoms of Diseases and Minor Ailments in Turkeys

To obtain accurate information on conditions which are warning signals of approaching trouble, contacts were made with turkey growers, both blind and sighted; county agricultural agents; veterinarians; specialists; and pathologists from the U. S. Department of Agriculture.

Whether blind or sighted, it is vitally important that turkey growers be able to detect the first signs of disease in their flocks, in order that treatment may be administered to prevent the outbreak from becoming widespread and financial loss serious.

Naturally, totally blind persons and persons with seriously impaired vision have difficulty in detecting the symptoms of certain kinds of illnesses; and when raising turkeys on the range, they

Raising Turkeys on the Range (Contd.)

must rely on sighted help for information. It is for this reason that arrangements should be made for someone, such as a sighted member of the family, a neighbor, or a supervisor provided by a feed dealer, to look the flock over, at frequent intervals, and advise the blind person regarding its condition. In all instances, even though sighted assistance is provided, the services of the county agricultural agent are of vital importance; and arrangements should be made for him to make regular inspection tours and advise the blind operator regarding the condition of his flock, in order that he may follow the best practices and use the proper methods to prevent disease.

### 1. Conditions

In the raising of turkeys for meat, there are two definite conditions that indicate approaching trouble and can be identified by sound or touch.

Inactivity.—Healthy turkeys are alert and active. They cheep, chatter, eat well, run and jump to catch insects, and fly at the slightest disturbance. The absence of any of these traits is an indication of trouble.

It is, of course, extremely difficult to detect these symptoms in a few turkeys when the flock is feeding on the range. However, it is the experience of blind poultrymen that when turkeys are confined to brooder houses and rearing pens, or the system of corralling turkeys for grain feeding is used, even a few birds which fail to respond to fright and squat listlessly on the ground are easily located by the attendant touching them with his feet. With these warning signals, a blind person will know to call the county agricultural agent, or a veterinarian to analyze the difficulty and to administer such treatment as may be necessary to prevent, or at least lessen the seriousness of disease in the flock.

Decrease in Feed Consumption.—Good poultrymen carefully weigh and apportion the quantity of feed to be consumed daily by their flock. When the birds fail to eat all of the feed, it is an indication of approaching trouble. The blind poultryman, of course, easily detects this condition by running his hand into the hopper containing the feed. One county agricultural agent has the following to say:

"Feed consumption usually drops one or two days before outward symptoms of sickness are noticeable. By measuring out just the right amount of feed needed each day and placing it in the feed hoppers early each



Raising Turkeys on the Range (Contd.)

morning, a blind person will know that there is something wrong with his flock if any feed is left in the feeders from the day before. He can then call the county agricultural agent or someone else to immediately make an early diagnosis, so that remedial action can be taken before the trouble reaches an advanced stage or gets completely out of control. A person with sight will often wait until he sees outward symptoms of trouble before taking action. Sometimes this is rather late."

A representative of a large feed concern, who is an authority on the raising of broilers, has this to say:

"By keeping daily records of feed consumption, you can notice a decline as soon as it appears. Correcting a problem in its development is much easier than suddenly to find out your flock is 'off feed' and a serious respiratory outbreak is affecting the growth and uniformity of your broilers."

## 2. Examples of Diseases Detectable by Touch, Sound, or Both

Touch.—Many ailments in turkeys are identified by touch. The birds droop, squat, are listless, or remain under foot, all of which are indications of some kind of approaching sickness, such as coccidiosis and hexamitiasis, blackhead, trichomoniasis, pullorum, infectious sinusitis, Newcastle, and erysipelas. (For symptoms see preceding section on Diseases.)

Sound.—All respiratory diseases are easily detected by sound. The birds gasp for breath, sneeze, wheeze, or have rattles in their throats, all of which are indications of approaching sickness, such as infectious sinusitis (air sac), Newcastle, pneumonia, and bronchitis. (For symptoms, see preceding sections on Diseases.)

Note: Infectious sinusitis and Newcastle may be detected by either sound or touch.

## H. Marketing

### 1. When to Market

According to information contained in "Farmers' Bulletin 1409," U. S. Department of Agriculture, experiments with standard-bred and Broad Breasted Bronze turkeys have shown that well fed young birds of these varieties are marketed to best

Raising Turkeys on the Range (Contd.)

advantage at ages ranging from 26 to 30 weeks, the average being 28 weeks. Under the most favorable conditions, hen turkeys of these varieties may be ready for market as early as 24 weeks and the toms at 26 weeks. However, many are marketed at 24 to 26 weeks that are somewhat deficient in fat and possess numerous short pinfeathers. In general, if turkeys are kept longer than 30 weeks, the cost of further grains and the extra labor for their care cause the cost of production to rise rapidly.

Small type varieties are ready for market at 22 to 26 weeks of age; however, with proper feeding and management, they may be marketed at 14 weeks as broilers. As with the larger varieties, conditions of rearing may affect the time required to produce market birds. Cool weather, during the later growth stages, tends to speed up growth and subsequent maturity in all types of turkeys.

## 2. Selecting Turkeys for Market

If rearing conditions have been satisfactory, the inspection of a few representative birds will serve to tell whether or not the flock as a whole is ready for market at the usual age. Under most conditions, it is important to market only turkeys which are fat and free from short, unpickable pinfeathers. To determine market quality, suspend the bird by the legs and examine the skin around the shoulders, over the breast, and on the drumsticks for presence of pinfeathers too short to be cleanly picked without leaving a deposit of feather pigment in the skin. If noticeable numbers of short pinfeathers are present, the bird will not pick clean.

Defects due to injuries before and after the birds are killed are common and cause loss of grade. Great care should be taken not to allow the birds to bruise themselves by flying or running against obstructions or by piling up; therefore, smothering and trampling each other. The use of a catching chute or a small catching pen is recommended. A strong catching hook is useful.

## 3. Shipping Live Turkeys

In shipping live turkeys, it is a good plan to consult the buyer and transportation company regarding details of crating and handling.

Careful handling of turkeys will do much to insure top prices. Birds with broken legs and wings, and bruises due to rough handling, go into lower grades and sell at lower prices.

Raising Turkeys on the Range (Contd.)

Crowding too many birds into the market coop may result in some being smothered or trampled and scratched so badly that they are almost a total loss. Allow room for all of the birds to stand fairly comfortably in the coop.

Coop size is important. It should be deep enough to allow the birds to stand, but no deeper. Shallow coops force the birds to rest on their breasts, which if bruised, results in a lower grade classification. A height of 18 inches is recommended for turkeys.

Since turkeys frighten easily and fly, thus bruising their flesh and frequently breaking bones, it is advisable to use a catching chute when catching and crating for market. The use of a catching chute prevents turkeys from piling, and enables the operator to catch them by the legs without being seen. One type of chute is 4' to 8' long by 24" to 30" wide and 3' high. The top is solid and there is no bottom. There is a sliding gate in each end and a set of fencing wings for one end. One or both sides may possess a slatted or wire covered framework which is covered with burlap coming to within an inch of the ground. The slatted framework comes to within about 12" to 16" of the ground. Birds are driven into the chute by way of the wings and are removed easily by the legs from under the burlap.

#### 4. Processing Turkeys for Market

Marketing dressed turkeys requires much more experience and special equipment than the average producer possesses or the size of his project warrants. Dressing turkeys for shipment is a rather hazardous business, and a careful study should be made before dressing is attempted. It would be advisable to arrange for some demonstrations before attempting to dress turkeys on a large scale. See the county agricultural agent for details.

In farm processing plants, turkeys are usually killed by one of two methods--cutting the bird's throat from the outside or from the inside. Cutting from the outside is the most popular method. Regardless of the method used, the large vein and the cross vein should both be cut.

In the standard method of slaughtering and picking, the bird is hung up by the feet with the head held in one hand by the operator. Barrels, funnels, and shackles hung from the ceiling, or line, rope, or cord hung from ceilings or pipes are



Raising Turkeys on the Range (Contd.)

used in killing and bleeding poultry. Killing by cutting the birds' throats from the outside and throwing them into barrels is the most efficient method from the standpoint of time and travel. However, from the standpoint of quality maintenance, carcasses of birds put into funnels or hung by shackles are superior, as the muscular spasms of birds thrown into barrels cause bruises.

Wet picking is the method most commonly used today. Birds are immersed in hot water ranging in temperature from 128 to as high as 190° F. Turkeys are often wet picked after being in water at a temperature of about 139° F, for a period of approximately 30 to 35 seconds for young birds, and from 40 to 50 seconds for adult birds. The time of immersion in a scalding tank depends upon the temperature of the water as well as the kind, class, and age of the birds. Experimental work on the part of the turkey grower is necessary to ascertain the scalding time and temperature required to prepare birds to suit consumer demands. Since it is necessary for the hot water to reach the skin of the birds, the water in the scalding tank should be agitated during the immersion, or the birds should be kept in continual motion while in the water. Scalding tank water should be kept clean. This is important as some of the scalding water may be absorbed internally by the birds; or when the external skin is torn, dirty water may cause the flesh to become contaminated.

There are two methods of picking turkeys--machine and hand. Machine picking is much more rapid than by hand. However, mechanical pickers need frequent attention from the standpoint of cleanliness; otherwise, all the carcasses may become contaminated by the continued accumulation of filth.

Picking by hand is the most common method, and a definite and desirable order for the removal of feathers is as follows:

1. Main tail feathers
2. Primaries and secondaries of the wings
3. Back
4. Legs
5. Area around vent
6. Contour feathers of the wings
7. Breast
8. Neck

A small handful of feathers should be pulled at a time, especially on the breast and thighs which are easily torn.

Raising Turkeys on the Range (Contd.)

Pinfeathers can best be removed by use of a poultry pinning knife or other instrument such as a strawberry huller. When pinfeathers cannot be removed without digging into the skin, they should be allowed to remain because a skin injury is worse than a pinfeather.

After pinning, the birds are singed by rotating them while being passed over a flame, in order to remove the hairs. On farms, singeing is done by use of bottled gas, a blow torch, an alcohol burner, or a kerosene burner.

Feed is stripped from the crop by massaging the crop and neck and forcing the feed out of the mouth. This is preferable to making an incision as it lessens the danger of spoilage and gives the bird a better appearance. Vents are squeezed to force out the fecal matter which may still be in the lower intestines. This is accomplished by pressing on the abdomen just below the vent.

In the final washing, the carcasses should be passed through a spray or sprays which provide an abundant supply of fresh clean water either under pressure or for scrubbing action.

Rapid chilling is essential in maintaining high quality of fresh killed poultry. Chilling increases the length of time that birds may be held without off-flavors developing. There are two general methods of chilling used on farms—ice and water chilling and air chilling. Ice chilling is most often used.

In most farm processing plants, hogsheads, milk coolers, or large metal or hard-surfaced tanks are used for ice and water chilling. All containers and equipment should be thoroughly cleaned with hot water and soap at least once a day. Only ice produced from water, suitable for drinking, should be used in vats or tanks. A temperature under that of 40° F., should be maintained at all times during chilling. Chilling tank water must always be clean. Only perfect and thoroughly cleaned birds should be placed in the chilling tanks.

The length of time carcasses should be allowed to remain in chilling tank is as follows: birds of less than 8 pounds, 6 hours; birds 8 pounds and over, 8 hours; or when the internal temperature has reached 36° F.

Raising Turkeys on the Range (Contd.)

In air chilling (unless the birds are dry picked) after being passed through a spray of clean water, the birds should immediately be hung on racks, ropes, or shackles.

## 5. Marketing Procedures and Trends

The marketing season for the bulk of the turkey crop usually is comparatively short, extending from early November through late December. However, there is an increasing demand in the winter and late summer for fresh roasting turkeys and a year-round market seems likely to be developed soon. Many turkey raisers sell their birds alive to poultry dealers who either dress or ship them alive to city markets. In sections where turkeys are grown in large numbers, dressing plants have been built by cooperative associations or by poultry processors who collect the birds and dress them for market.

Farmers near city markets often dress their turkeys and sell them direct either to the consumer or to city retail dealers. In territories adjacent to large cities, marketing of both live and dressed birds at roadside markets has become common. Some growers have developed profitable gift-package businesses, delivering by truck, express, or parcel post. The dressed turkeys are shipped in sealed packages containing dry ice—about 1 ounce of ice per pound of turkey.

In certain localities, turkey growers may take advantage of the unique method of marketing turkeys by conducting a "Turkey Shoot." A true example is that of a small grower who began with 150 poults. When marketing time came, the owner, who was quite a sportsman, decided to hold a "Turkey Shoot." He furnished the shells and charged \$1 for each shot. The number of chances or shots was determined by the number of pounds of live weight per turkey; thus, an 18-pound turkey at \$1 per shot would net \$18 minus the cost of the 18 shells. This method of marketing proved so satisfactory and successful, that over a period of 6 years he built his turkey business up to 750 or 800 turkeys per year, each of which was marketed through shooting matches held from the first of November through the end of December. This brought a tremendous profit in comparison to the normal or conventional methods of marketing poultry.

New marketing developments which have helped to popularize turkey meat and definitely appeal to homemakers are: eviscerated turkeys (whole) ready for the oven and sometimes stuffed with dressing; turkeys cut into halves, quarters, steaks, or similar pieces; and the availability of the small type turkey.



Raising Turkeys on the Range (Contd.)I. Record Keeping

The many details which are of vital importance to the success of poultrymen make some form of record keeping a necessity. A good system of records keeps the business on a sound basis; reflects the economic possibilities of poultry; develops business leaders; provides poultry raisers with helpful and timely information; and assists in establishing a favorable credit rating. Daily records should be kept of feed consumption, expenditures, and income.

Turkeys should be given all the feed they will clean up. The kind and amount they eat will increase with their age, and any decrease in feed consumption is an indication of some form of approaching trouble. For this reason it is necessary to carefully weigh, and keep a daily record of all feed consumed by turkeys of different sizes and ages. Record keeping cards for this purpose can be obtained from all feed stores; poultry growers associations; and the State Departments of Agriculture.

Successful turkey growers keep a detailed accounting of all expenditures and income as follows: Costs of poults; cost of buildings and materials for constructing fences, range equipment and other facilities; brooders; waterers; feeders; tools; feed (starting mash); seeding; pastures, grain, and oyster shells; medicine; disinfectants; insecticides; veterinarian services; insurance; interest; electricity; water; depreciation of buildings (5 percent per annum); brooders and other equipment (10 percent per annum); loss of poults from death or other causes; transportation; and when the project is not a full time operation, man-hours of labor.

Income from all available sources should be carefully recorded. It may include returns from the sale of live or dressed turkeys; turkeys eaten by the family (credited at prevailing market prices); and by-products, such as the sale of fertilizers and feathers.

Account books especially compiled for the use of keeping records of expenditures and income of farm projects may be obtained from State Departments of Agriculture.

J. Training

Training in the proper use of scientific methods of poultry management and modern equipment is of the utmost importance to poultrymen, whether blind or sighted.

Raising Turkeys on the Range (Contd.)

Information obtained from bulletins published by the U. S. Department of Agriculture, State Departments of Agriculture, and associations interested in research and improvement of the poultry industry, proves that the most successful growers are trained persons who avail themselves of every opportunity to improve their methods and increase their knowledge of the poultry business.

Irrespective of sight and training, everyone is not suited, either by temperament or physical make-up to be a poultryman. Therefore, it is important that blind persons, before planning a training program for the raising of turkeys, make certain they possess the abilities and qualifications essential to their happiness and success. They should be mobile; well adjusted to their blindness; able to qualify for the job of raising turkeys on the range as described under "Job Specifications," (Section IV, page 91) like living in the country; possess at least average ability to do simple construction work and make minor repairs on buildings and equipment. They must like the kind of poultry they are to raise; have no aversion to working with sick poultry or performing the somewhat distasteful tasks of cleaning and sterilizing dirty, foul smelling poultry houses; be able to take reverses without becoming unduly discouraged; like to work alone; have no objection to being tied closely to their work and kept at home; be willing to work long hours; like to attend to details; be punctual and perform their duties regularly; and be willing to meet emergencies as they arise, day or night.

After careful consideration has been given to the many factors affecting the lives of individuals, and it seems reasonable to assume they will be successful in raising turkeys, a comprehensive program of training which will meet the needs and desires of the individual should be developed. The training plan should be written out in detail. Where training supplies, materials, or equipment is required, the trainer, all materials, equipment, and supplies should be approved by the county agricultural agent, the State Commissioner of Agriculture, or some other recognized authority.

The kinds and amount of training required to fit blind persons for raising turkeys on the range will vary in individual cases. It will depend upon such things as their background of experience, education, skills, knowledge of poultry and poultry work, and the methods they plan to use in raising and marketing turkeys.

Turkey growers, especially operators of small and medium size projects must possess a wide variety of skills (in addition to their knowledge of turkeys), for their responsibilities are those of manager, planner, supervisor, laborer, and businessman.

Raising Turkeys on the Range (Contd.)

Operators of large projects may not take part in the daily work of caring for turkeys and constructing and repairing equipment. Therefore, the variety of skills they possess need not be so diversified, since they must employ several workers, each of whom must have the ability to perform the different tasks that are essential to the success of the project.

Before undertaking to raise turkeys, it is strongly recommended that blind persons who have not acquired the necessary knowledge and skills through experience or working with others engaged in the business, should take a course of training in the care of poultry, poultry management, and farm shop work.

Some of the training programs now in operation are described in the following paragraphs:

1. In a few States, the agency providing vocational rehabilitation services for the blind and the College of Agriculture work together in organizing and conducting farm training for the blind.

In some instances, persons are enrolled as special students and receive instruction through lecture courses, class discussion, and supervision in the physical performance of the details of the daily work as it is conducted on the college farm.

In other instances, specialists from the various farm divisions of the college serve as consultants and advisers to the vocational rehabilitation counselors working with farm clients. The counselors then confer with the county agricultural agent and select an experienced and successful farmer, who observes, supervises, and assists the trainee in the operation of his project which has been set up on his farm. The farmer who acts as supervisor makes regular reports on the progress of the trainee to the rehabilitation counselor and county agricultural agent.

2. A private agency, the Cincinnati Association for the Blind, operates a farm school for the blind at Mason, Ohio. Courses are offered in the care of poultry and poultry management, dairying, bee keeping, hog raising, farm maintenance, and farm shop work. As the demand arises, other courses are added to meet the needs and desires of individual trainees.



Raising Turkeys on the Range (Contd.)

Trainees attend lectures given by specialists from the various divisions of the agricultural college, and take part in the daily work under the immediate supervision of their instructors and the superintendent of the farm. In addition, trainees are given instruction in orientation to a farm situation and afforded an opportunity to participate in outside activities which are of interest to farmers (Grange meetings, and special classes conducted under the direction of the home demonstration agent, county agricultural agent, and instructors of vocational agriculture). Upon completing training at the farm school, some State vocational rehabilitation agencies assist the trainee in setting up a project on his own farm under the immediate supervision of the county agricultural agent. A reputable farmer supervises and advises him on the best methods of operation. The farmer and the agent also make regular reports on the trainee's progress to the Vocational Rehabilitation Counselor.

3. One State Agency, Missouri, has a farm training program which it operates on a 143-acre farm under the direction of the owner, who is a graduate in agriculture, a successful farmer, and has about 5/200 vision. Programs are set up to meet the needs and desires of the individual trainees; and in most instances, extend over a 9-month period.

Before completing a course, each trainee takes over the entire management of the farm for one month, and outlines the plan he intends to follow on his own farm.

The rural specialist makes frequent checks on the trainee's progress and assists in setting him up on his own farm, where he completes his training under the supervision of the county agricultural agent.

4. Most State agencies have no regular plan for training clients to become farmers or farm workers. Individual training plans are made by the rehabilitation counselor as the demand arises; and such trainers as feed dealers, individual farmers, and county agricultural agents are employed to observe, advise, and supervise the projects. Trainees, under this plan, acquire their knowledge from supervised work experience and reading of textbooks and bulletins published by authorities on the particular farm activities in which they are interested. In some instances, on-the-job training as a farm worker is considered most practical.

### Raising Turkeys on the Range (Contd.)

When training, as described in this section is given a client, it is of the utmost importance that regular reports of the trainee's progress be made to the vocational rehabilitation counselor, in order that he may evaluate the training and provide additional assistance as may be necessary.

#### K. Cost of a Training Project

No attempt will be made to estimate the cost of purchasing land or erecting buildings. These factors fluctuate and differ greatly in the various parts of the country and will be governed by local conditions and personal situations. Many persons own or have access to a small piece of land in the suburbs, a small acreage in the country, an unused portion of a general farm or grazing land, which could be used for raising turkeys on the open range. Frequently, the property has unused buildings on it, such as a garage, poultry house, or shed that could be converted into sanitary and convenient quarters for turkeys. Often there is sufficient scrap lumber about the place to make alterations and construct range equipment, and a person who is handy with tools can do the necessary work with little or no financial outlay. The utilization of these materials cuts the financial outlay for equipment decidedly and requires mainly initiative and skill on the part of the operator. When it is necessary to purchase lumber, nails, and a few incidental items, the cost will be very little.

Since it is impossible to know all the conditions and circumstances affecting the starting of a project, the example, given below is based on three conditions; namely

1. That the client have adequate space and housing for raising 300 turkeys; that the building in which they are to be housed needs only minor repairs; that there is sufficient scrap lumber, poles, and materials about the place to construct range equipment and roosts; and that the client has the skill and ability to make the necessary improvements himself.
2. That the client purchase 300 one-day old poults of the large type, to be started the last of May, and marketed the last of November (about 24 weeks) as roasters.
3. That  $\frac{3}{4}$  of the feed consumed must be purchased.

Example: Any space containing approximately 200 square feet that can be kept warm; free from rodents; dry; well ventilated and free from drafts and providing some sunlight, will accommodate 150 poults during the brooding period of 8 weeks. Three hundred

Raising Turkeys on the Range (Contd.)

poults would require two brooder houses, each consisting of 200 square feet of floor space. Additional space, separate from the brooder house and rodent-proof, should be available for storing feed.

According to information obtained from county agricultural agents in different parts of the country, lamp heated brooders are inexpensive, efficient, and adequate. A heating device that will take care of 150 poults is estimated to cost approximately \$10 (exclusive of labor), including minor electrical installations and heating bulbs. Two lamp heated brooders would be required for 300 poults--a cost of \$20.

Feeders and waterers can be made for brooder houses, or purchased for a very small sum, approximately \$10. Sanitary feeders and waterers to accommodate 150 growing turkeys can also be built at a good saving, or purchased for about \$25--\$50 for 300 turkeys.

According to information obtained from county agricultural agents and hatcheries, day-old turkeys of the large type, from strains having disease free records, can usually be purchased for 75 cents each, or \$225 for 300 poults.

Reliable data shows that large type turkeys raised on the range to market age of 24 weeks require 3 to  $4\frac{1}{2}$  pounds of mash and grain, in addition to forage, to produce one pound of meat; that the average cost of feed (mash and grain) in 1953 was \$5.50 per hundred weight; that the cost of electric heat and medicine (during the brooding period of 8 weeks) is approximately  $\frac{1}{2}$  cent per pound of turkey meat; and that successful growers raise approximately 90 percent of their turkeys to market age. Using these figures as a basis and taking 3.3 pounds as the amount of mash and grain required to produce one pound of the large type turkey to a market age of 24 weeks, it would cost  $18\frac{2}{3}$  cents to produce one pound of large type turkey meat.

Consider that 270 turkeys (after deducting 10 percent of 300 for mortality) averaging 17 pounds each, at 24 weeks, were sold as roasters, the cost of feed, heat, medicine, and poults (300 at 75 cents each) would be \$1,080.90.

The items of cost for establishing a training program as described in this example are as follows: Feeders and waterers for brooders, \$20; heat lamps and wiring, \$20; materials for building feeders and waterers for growing turkeys, \$50; 300 poults at 75 cents each, \$225; feed, heat, and medicine for 270 large type poults raised to market age, \$858.60. Total cost of project, \$1,173.60.



Raising Turkeys on the Range (Contd.)

The net return from the sale of 270 17-pound large type turkeys (4,590 pounds) at the 1953 live weight market price of 34 cents per pound is \$1,560.60, less the total cost of \$1,173.60, would be \$387.

The net return from the sale of 270 17-pound large type turkeys, \$387, less the cost of equipment purchased for the project, \$90, would be \$297.

In training projects conducted in areas of the country where the operator can raise his own grains, the cost will be cut materially from that given in the example.

## REMARKS

The above information was obtained from a personal interview with Mr. VaNon Dahle, a totally blind man and his sighted wife, who were engaged in the raising of turkeys on the range near Clarkston, Utah; the text "Turkey Management" by Marsden and Martin; "Starting Right with Turkeys" by G. T. Klein; Farmers' Bulletin No. 1409 titled "Turkey Raising" and Farmers' Bulletin No. 1652, "Diseases and Parasites of Poultry," published by the U. S. Department of Agriculture, Washington, D. C.; and from consultation with two county agricultural agents who have observed and worked with successful poultry raisers who are blind.

Authorities agree on all of the important phases of the industry, and persons contemplating the raising of turkeys should avail themselves of the information derived through research and the experience acquired by persons engaged in the business.

Irrespective of sight, growers should, at the first sign of disease in the flock, consult the county agricultural agent for advice, obtain the services of a veterinarian to diagnose disease and administer treatment. (See section on Diseases, Pests, and Common Ailment, page 66); take advantage of current information developed on scientific methods of feeding, care, and management; and attend schools conducted by the National Turkey Improvement Plan for training growers in methods of selecting turkeys for marketing and grading dressed turkeys.

All of the operations involved in the raising of turkeys have been observed and analyzed by a totally blind staff member in Services for the Blind; and it has been determined that many of the operations involved in the daily work of raising turkeys on the range require full use of sight. It, however, does not mean that a blind or visually impaired person with sighted assistance cannot be successful raising turkeys by this method. Mr. VaNon Dahle, a totally blind man who, with the assistance of his sighted wife, raises turkeys on the range near

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Clarkston, Utah, has demonstrated that the management of the business and about 75 percent of the work can be performed successfully and profitably without sight. Blind persons possessing the skills to successfully care for turkeys will usually have imagination and ingenuity sufficient to solve problems as they arise, such as purchasing a Braille thermometer for controlling temperature.

The raising of turkeys provides five distinct possibilities; namely, an opportunity for:

1. Families of small means and with limited space who, by raising their own meat, will reduce their living costs.
2. Operators of general farms or projects of a mixed nature who want to increase their number of activities to supplement their sources of income.
3. Growers wishing to engage in a project for the exclusive purpose of marketing live and dressed turkeys to the wholesale and retail trade.
4. Persons desiring to establish a business selling dressed turkeys, with or without stuffing; in halves; or cut-up and sold by the piece direct to the consumer.
5. Persons having access to a large acreage of grazing land with an abundance of grasshoppers, and grain or rice fields, which could be leased for turkey range after harvest time.

Before deciding to engage in a project of a commercial nature, blind persons should make certain that:

1. There is a dependable market.
2. They have selected a variety which is best suited for the type of customers to be served.
3. There is a reliable source from which to purchase hatching eggs and poults having a disease-free record.
4. They possess a working knowledge of the business acquired through experience or training.
5. They are familiar with the services of the National Turkey Improvement Plan; Turkey Growers Association; the State and Federal Experiment Farms; and the U. S. Department of Agriculture.

Raising Turkeys on the Range (Contd.)

6. They are familiar with the services provided farmers by the various County, State, and Federal agencies.
7. They have sighted assistance that is dependable, such as a wife or other member of the family; partner; or hired help; to advise regarding condition of the flock and premises, and to perform the jobs which require sight.

## JOB SPECIFICATIONS

Tasks Performed

The operator obtains the various types of feed, including the concentrates and succulents, from source of supply, and stores it in a feed room or building adjacent to the turkey house. He measures and weighs the feed and places it in the feeder. He sterilizes and fills the water containers. The brooders, rearing pens, and equipment are kept clean, sanitary, and in good repair. On the range he fills the feeders and waterers; keeps them clean and sanitary; keeps feeding corral and range shelter clean and free from contamination; maintains repairs and constructs equipment; and assists sighted persons with the operations involved in moving equipment, establishing camp, and erecting corrals for feeding and protection from thieves, animals, and weather. He must constantly watch and inform his co-worker of any sign of approaching disease or other trouble. He keeps simple records of his expenses and income. He must constantly watch for the first sign of disease. He sells his stock by contacting his customers by letter, phone, or in person.

## REQUIREMENTS

Physical: Active age; standing and walking most of the time. Bending is required to care for turkeys and repair buildings and equipment.

Feet: Ability to walk, stand, and stoop.

Hands: The use of both hands.

Thumbs: The use of one or both.

Fingers: Index, middle, and ring finger on one hand or both.

Vision: Vision is required for herding, driving, caring for and overseeing flock on the range, and for moving equipment from place to place. No vision required during the brooding period, or for maintaining, repairing and constructing fences and equipment; or providing management services.

Hearing: When the worker is blind, good hearing is required.



Raising Turkeys on the Range (Contd.)

Mental: Alertness, good memory, coordination, and ordinary pace.

Educational: Understanding of the English language; ability to read and write is important, but this service could be supplied by a member of the family or a reader may be hired.

Physical Environment: Usually in small or medium-sized buildings during the brooding period (feed house, brooder house, and rearing shed); works in the open (in small fields or on the open range), noisy; works alone or with sighted help as required when feeding or watering turkeys; cleaning equipment and shelters; maintaining or constructing equipment; works with sighted help in performing all duties involved in caring for the flock on the range.

Raising Turkeys (Contd.)

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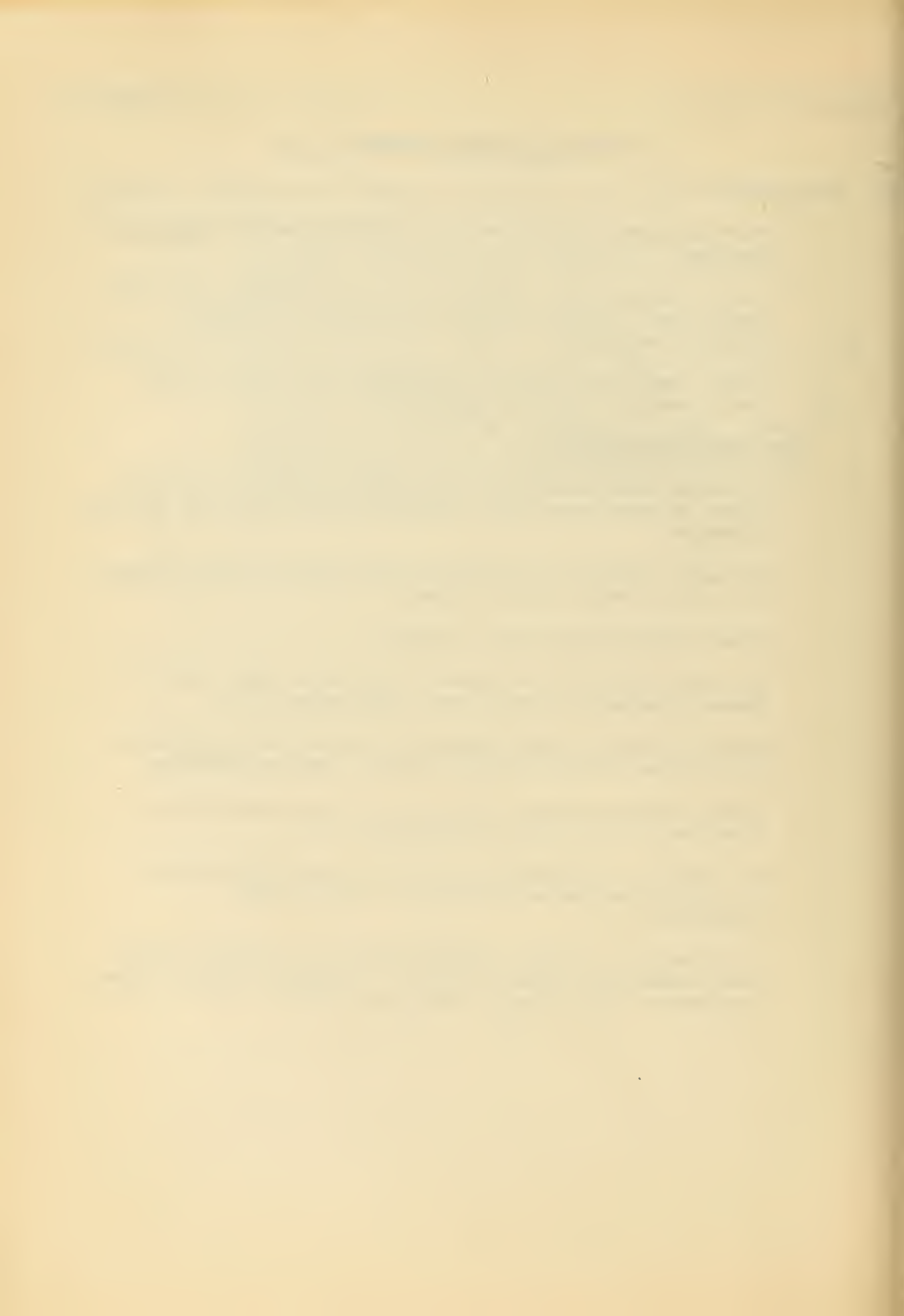
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DEPARTMENT OF  
HEALTH, EDUCATION, AND WELFARE  
Office of Vocational Rehabilitation  
Washington 25, D.C.

June 30, 1954

REHABILITATION SERVICE SERIES NUMBER 52 - APPENDIX C

O: Divisions of Vocational Rehabilitation; Commissions and other  
Agencies for the Blind

SUBJECT: Appendix C, "Methods Used by Blind Persons in Detecting Signs  
and Symptoms of Diseases and Common Ailments in Poultry,"  
Handbook of Job Descriptions in Rural Activities Suitable for  
the Employment of Blind Persons

The attached material is to be inserted as Appendix C  
to the Handbook of Job Descriptions in Rural Activities Suitable  
for the Employment of Blind Persons.

The question, "How blind persons can detect signs of  
approaching trouble in time to prevent a serious outbreak of  
disease in their flocks," has arisen with the increasing number  
of persons without sight engaged in poultry raising.

A blind staff member of Services for the Blind, in  
cooperation with a successful blind poultryman, a county agri-  
cultural agent, and a specialist from the U.S. Department of  
Agriculture, has prepared this material with the hope that it  
will aid counselors who have blind clients engaged in the  
raising of poultry.

*M. I. Tynan*

M. I. Tynan, Chief  
Services for the Blind

Attachment

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HANDBOOK OF  
JOB DESCRIPTIONS IN RURAL ACTIVITIES  
SUITABLE FOR THE EMPLOYMENT OF BLIND PERSONS

APPENDIX C

METHODS USED BY BLIND PERSONS IN DETECTING SIGNS AND SYMPTOMS OF  
DISEASES AND COMMON AILMENTS IN POULTRY

To obtain accurate information on conditions which are warning signals of approaching trouble, contacts were made with poultry growers, both blind and sighted; county agricultural agents; veterinarians; and pathologists from the United States Department of Agriculture.

Whether blind or sighted, it is vitally important that poultry growers be able to detect the first signs of disease in their flocks, in order that treatment may be administered to prevent the outbreak from becoming widespread and financial loss serious. The actions of a bird indicate the condition of its health, good or bad, and can be detected without the use of sight. Blind persons, themselves, who carefully observe the bird's actions and behavior, can recognize any significant changes in time to call for assistance from a veterinarian.

Naturally, totally blind persons and persons with seriously impaired vision have difficulty in detecting the symptoms of certain kinds of illnesses and must rely, to some extent, upon sighted help for information. It is for this reason that arrangements should be made for someone, such as a sighted member of the family, a neighbor, or a supervisor provided by a feed dealer, to look the flock and premises over at frequent intervals, and advise the blind person regarding their condition. In all instances, even though sighted assistance is provided, the services of the county agricultural agent are of vital importance. Arrangements should be made for the agent to make regular inspection tours and advise the blind operator regarding the condition of his flock, in order that he may follow the best practices and use the proper methods to prevent disease.

I. CONDITIONS OF A HEALTHY BIRD

Healthy birds are alert and active; they cheep, chatter, cluck, cackle, scratch for food, eat well, run and jump to catch insects, and fly at the slightest disturbance.

When healthy birds are picked up and examined, they are gentle and submissive; their bodies are found to be well formed, full and plump, with a well developed breast and firm flesh; the beaks show no indications of swelling; combs and wattles are free from any abnormal abrasions, nodules, or protuberances; no swollen places will be found around the face; no tears are emitted from the eyes; feathers



## APPENDIX C (Contd.)

over the body feel clean, firm, and free from filth and pastiness in the area of the vent; legs are normal, free from scales, with no twistings or distortions; and there is no offensive odor which is distinctive from the regular poultry smell.

In laying flocks, hens that are active producers have enlarged abdomens, soft pliable skin, moist vents, and 2 or 3 fingers can be placed between the pin bones.

### II. CONDITIONS AND WARNING SIGNALS OF APPROACHING TROUBLE

In the raising of poultry, there are three definite conditions which are warning signals that indicate approaching trouble and can be identified by sound or touch.

#### A. Inactivity

The absence of any of the traits or conditions, mentioned under Section I--Conditions of a Healthy Bird, is an indication of approaching trouble, and can be detected by sound or touch.

It is difficult, of course, to detect these symptoms in a few birds when a person is attending a large flock. However, it is the experience of blind poultrymen that, even when a few birds become inactive, fail to respond to fright, and squat listlessly in the pen (occasionally, heavy producing birds will squat at the touch of the foot during mating season), they are usually located by the attendant touching them with his feet. With these warning signals, a blind person will know to call the county agricultural agent, or a veterinarian, to analyze the difficulty and administer such treatment as may be necessary to prevent, or at least lessen the seriousness of disease in the flock.

#### B. Decrease in Feed Consumption

Good poultrymen carefully weigh and apportion the quantity of feed to be consumed daily by their flocks. When the birds fail to eat all of the feed, it is an indication of approaching trouble. The blind poultryman, of course, easily detects this condition by running his hand into the hopper containing the feed.

One county agricultural agent has the following to say:

"Feed consumption usually drops one or two days before outward symptoms of sickness are noticeable. By measuring out just the right amount of feed needed each day and placing it in the feed hoppers early each morning, a blind person

APPENDIX C (Contd.)

will know that there is something wrong with his flock if any feed is left in the feeders from the day before. He can then call the county agricultural agent or someone else to immediately make an early diagnosis, so that remedial action can be taken before the trouble reaches an advanced stage or gets completely out of control. A person with sight will often wait until he sees outward symptoms of trouble before taking action. Sometimes this is rather late."

A representative of a large feed concern, who is an authority on the raising of broilers, has this to say:

"By keeping daily records of feed consumption, you can notice a decline as soon as it appears. This is a definite sign that something is wrong. Correcting a problem in its development is much easier than suddenly to find out your flock is 'off feed' and a serious respiratory outbreak is affecting the growth and uniformity of your broilers."

### C. Falling Off of Egg Production in the Laying Flock

Progressive poultrymen, whether blind or sighted, keep close records of egg production. A falling off in the daily count indicates two conditions: (1) hens may be diseased or plagued with parasites; or (2) hens may be broody or going into a molt. After a season of heavy production a good layer has a rough unkempt plumage, and a poor layer has a clean smooth coat of feathers. Blind poultrymen can easily detect these conditions by examining the plumage of the hens with their hands.

## II. EXAMPLES OF DISEASES, PESTS, AND COMMON AILMENTS IN POULTRY, THEIR SIGNS AND SYMPTOMS WHICH CAN BE DETECTED BY TOUCH, SOUND, SMELL, AND A COMBINATION OF THESE METHODS

### A. Touch

Many ailments in poultry are detectable by touch. Approaching trouble is apparent when the birds droop, are lame, squat, are listless, remain under foot, show a decrease in egg production, have a smooth glossy touch to their feathers, or there is a discharge from infected areas.

To keep themselves acquainted with the actions and conditions of the birds, alert poultrymen make daily checks of their flocks. Whether blind or sighted, they rely heavily on all the senses for information, although the sense of touch probably gives the most accurate picture of the development and condition of a bird.

APPENDIX C (Contd.)

When a poultryman's attention has been attracted by an unusual action, sound, or unfamiliar behavior on the part of a bird in the flock, he involuntarily picks up the bird and makes an examination. Careful inspection of the bird from head to foot will reveal the presence of certain conditions which indicate specific illnesses as follows:

Abrasions, nodules, or protuberances on comb and wattle - Fowl Pox

Swollen conditions on one or both sides of beak - Canker

Swollen eyes - Roup

Secretion from eyes or nostrils - Cold

Head hanging with neck limp or twisted - Limberneck or Leukosis

Distorted head posture (tends to bend backward) - Newcastle or Encephalomyelitis

Stubby neck feathers - Neck Mites

Crop enlarged, hanging, bulging and hard - Cropbound

Crop pendulous and soft - Inflammation of Crop or Enlarged Crop

Body thin and emaciated - Internal Parasites or Chronic Coccidiosis

Body thin and emaciated with swollen joints, causing lameness - Tuberculosis

Abdomen hard, sometimes enlarged with lump inside - Tumor or Internal Layer

Abdomen enlarged and soft, a substance like a sac of water is felt - Dropsy

Filthy, pasty substance on feathers in the area of the vent - Diarrhea

Mass of soft material protruding from vent combined with sticky moistness - Prolapsed Oviduct

Broken or stubby feathers around vent - Mites



APPENDIX C (Contd.)

Legs twisted, crooked, bowed, and swollen - Perosis or Rickets

Legs paralyzed or wings hanging limp - Fowl Paralysis, Range Paralysis, or Lymphomatosis

Shanks with scales standing out - Scaly Leg Mite

Swelling on bottoms of feet and between toes - Bumblefoot

B. Sound

All respiratory diseases are easily detectable by sound. Approaching trouble is apparent when the birds gasp for breath, cough, sneeze, wheeze, and have rattles in their throats.

A representative of one of our large poultry concerns, who is an authority on the raising of broilers, tells of a sighted poultryman who is alert and very successful. During the darkness of the night, he heard a slight wheezing in the throats of one or two birds in his flock. This was, of course, an indication of approaching trouble. He immediately took preventive measures and an epidemic in his flock was averted.

Listed below are 9 major respiratory infections which may be encountered in the raising of poultry:

Newcastle Disease	Laryngotracheitis
Bronchitis	Chronic Fowl Cholera
Turkey Sinusitis	Aspergillosis
Chronic Respiratory Disease	Gapeworms
Infectious Coryza	

Three other sounds which indicate trouble, although not respiratory in nature are:

Weakened cry - Epidemic Tremor (Usually found in young birds)

Sharp cry frequently emitted - Rose Chafer Poisoning  
(More fatal to young birds)

Cry or squawk of exertion - Prolapsed Oviduct (Mature hens)

APPENDIX C (Contd.)

C. Smell

The presence of some diseases in poultry is detectable by smell. In certain diseases, birds suffer from infections, eruptions, and bowel disorders--all of which have unusually offensive odors that are distinctive from the usual poultry house smell.

Vent Gleet.--An unusually foul odor from the droppings and an offensive odor around the affected areas of the vent indicate the presence of the disease.

Although they have not been described in this material, certain other diseases, such as infectious coryza (rhinitis, roup, cold), fowl cholera, and rickets also emit unusually foul smelling odors and are definite indications of trouble.

D. Touch, Sound, and Smell

Many diseases, their signs, and symptoms, which are enumerated under touch, sound, and smell are detectable by one method or a combination of two or all methods.

DEPARTMENT OF  
HEALTH, EDUCATION, AND WELFARE  
Office of Vocational Rehabilitation  
Washington 25, D.C.

June 30, 1954

REHABILITATION SERVICE SERIES NUMBER 52 - SUPPLEMENT 7

TO: Divisions of Vocational Rehabilitation; Commissions and other  
Agencies for the Blind

SUBJECT: Job Description, "Raising Turkeys in Confinement and on the Range,"  
Handbook of Job Descriptions in Rural Activities Suitable for the  
Employment of Blind Persons

The attached job description of a Specialty Farm for Raising Turkeys, USES Code 3-08.10, should be inserted in PART II-B as JOB NO. 9 of the Handbook of Job Descriptions in Rural Activities Suitable for the Employment of Blind Persons.

The job description is written in two chapters, each of which is a separate and distinct project; namely, Chapter I--Raising Turkeys in Confinement (off the ground), and Chapter II--Raising Turkeys on the Range. Since the history of the industry and the methods of acquiring stock are the same, regardless of the system used, these sections appear only at the beginning of the job description. For the same reason, the bibliography appears only at the end of the description.

The job, as described in Chapter I--Raising Turkeys in Confinement, like those already in the Handbook, has been observed and tested by a blind staff member in Services for the Blind. The job, as described in Chapter II--Raising Turkeys on the Range, has been observed and analyzed by a blind staff member of Services for the Blind.

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SPECIALTY FARM

RAISING TURKEYS

TURKEY RAISER - USES CCDE 3-08.10

There are two species of turkeys now living in the world. One is the beautiful ocellated or Yucatan turkey, *Agriocharis ocellata*, which rivals the peacock in brilliance of plumage. It inhabits the tropical forests of southern Mexico and Central America and, so far as can be determined, never has been domesticated. The other species is the North American wild turkey. It once abounded in New England and along the northern Atlantic seaboard. It is from this species that the turkey of today, having been domesticated by the Indians long before the discovery of America, is supposed to have been derived. From this, five subspecies are recognized: (1) the Eastern turkey which was formerly found from the Gulf Coast to Maine. This subspecies has been exterminated in New York and New England; (2) the Florida turkey which is found today in the southern two-thirds of the Florida peninsula; (3) the Rio Grande wild turkey which ranged over southern Texas and northwestern Mexico; (4) Merriam's turkey, which inhabited Arizona, New Mexico, southern Colorado, western Texas, and northwestern Mexico; and (5) the Mexican wild turkey, which ranged over central Mexico and is still in existence.

In their wild state, turkeys inhabit chiefly deep woods, borders of swamplands, and the banks of streams. At one time they were abundant in many places, and early writers tell of their custom of gathering in flocks of hundreds and migrating on foot for long distances in quest of food.

When laying time approaches, the hens steal away and make their nests in the grass or bushes in some open space in the woods, or brush grown fields. They lay 12 creamy white and somewhat speckled eggs in nests, which they hide with great care, not only to avoid foxes and other predatory animals, but to prevent detection by the gobbler. It is unanimously believed that he will break the eggs if he comes upon them.

In domestication, turkeys are quite difficult to raise as they require wide range and protection from dampness and disease. When these conditions are met and growers make use of adequate facilities, modern equipment, and technical information available to farmers, the raising of turkeys is an important and profitable occupation.

The important areas of production now are the Middle West, the Pacific Coast, and the Middle Atlantic States, where large numbers of small and medium-sized turkeys are raised on farms and ranches. Up to 60,000 turkeys have been raised on one farm in a season. Usually, however, when turkeys feed on the range, not more than 5,000 are reared in one

Raising Turkeys (Contd.)

flock, and flocks of 1,500 to 2,500 are popular sizes for commercial enterprises. When raised in confinement (off the ground--on wire, slats, or pebbles), smaller flocks (100 to 1,000) are popular sizes and can be raised profitably.

With new and scientific developments on the breeding and care of turkeys, plus the increasing national demand for turkey meat, the industry has extended to all parts of the country.

According to the census, there were 10,754,060 turkeys in the United States on June 1, 1890, and 6,594,695 on June 1, 1900. Although for the ensuing 30 years there was a general decline in the industry, the Bureau of Agricultural Economics estimated that 18,476,000 turkeys were raised in 1929; and that by 1951, the number of turkeys was 52,261,000, with an estimated 58,800,000 for 1952.

The gross income for turkeys in the United States reached \$272,759,000 in 1949. This was approximately 8 percent of the value of all poultry products combined. In 1951, which was the record year, the gross income from the sale of turkeys reached \$343,772,000.

With the development of a smaller variety or breed of turkey which more nearly meets the needs of the average family, and the modern facilities for storing large quantities of frozen foods, the annual consumption of turkey meat continues to increase.

## I. ACQUIRING STOCK

Stock can be obtained by (a) owning a breeding flock and producing eggs and poults; (b) buying eggs and having them hatched under turkey hens, in incubators, or by commercial hatcheries; and (c) buying day-old poults from hatcheries. Poults to be marketed as broilers and small roasters should be started in February and early March. Turkeys for the Thanksgiving and Christmas markets should be started in June and July.

All eggs or poults should be from well-bred flocks, free from pullorum and other diseases. When turkeys beyond the day-old stage are purchased, the disease history of the flock should be investigated and the stock should be examined for lice upon arrival. Poults should be quarantined for 2 or 3 weeks to detect any possible disease or internal parasites.

Information regarding reliable sources from which to purchase hatching eggs, poults, or young turkeys may be obtained by communicating with the following agencies and organizations:



Raising Turkeys (Contd.)

The American Poultry Association, Davenport, Iowa, has for its primary function the standardizing of varieties of poultry in North America. The Association publishes the "American Standard of Perfection" which contains concise descriptions of breeds and varieties of poultry;

The National Turkey Improvement Plan, now in operation in most States, provides for official supervision of breeding flocks and small-type turkeys; thus assuring adequate control for the quality of turkeys produced commercially. Authority for the administration of the Plan is contained in the Department of Agriculture Organic Act of 1944. The Plan is administered in each State by an official State agency cooperating with the Bureau of Animal Industry, United States Department of Agriculture. The primary objectives of the National Turkey Improvement Plan are to improve the production and market quality of turkeys and to reduce losses from disease. Through it, turkey breeding stock, hatching eggs, and poults may be identified, authoritatively, with respect to breeding quality and degree of freedom from pullorum disease. The official State agency recognized by the Bureau of Animal Industry, to cooperate in administering the Plan within a State, may be the State Department of Agriculture, State College of Agriculture, or other agency recognized officially by the State government; and

Extensive research has been conducted on the United States Experiment Farms at Beltsville, Maryland, and at many State universities and colleges. Persons desiring to purchase hatching eggs or day-old poults for the purpose of raising turkeys should consult the local county agricultural agent for advice, and write to the United States Department of Agriculture and the Departments of Agriculture in their States concerning certified dealers and hatcheries from which to purchase the breeding strains of turkeys which are most suitable for the type of project to be conducted.

SPECIALTY FARM  
RAISING TURKEYS

CHAPTER I - RAISING TURKEYS IN CONFINEMENT (OFF THE GROUND)

II. OPERATIONS INVOLVED AND FACTORS TO BE CONSIDERED

The following information was secured from a personal observation, analysis, and performance of the operations involved in the raising of turkeys on the farm of Steve Alsaesar, a totally blind man of Cincinnati, Ohio; from a comprehensive study of bulletins, books, and journals published by the United States Bureau of Animal Industry; from books written by authorities on turkey raising; and from two county agricultural agents.

A. Advantages and Disadvantages of the System

The chief advantages are:

1. That only a small area of land is needed, and the turkeys are concentrated under the direct control of the operator. (This latter fact is of extreme importance to persons with little or no sight. It eliminates the necessity of extensive travel, and enables them to perform a larger percentage of the work than would be possible when caring for turkeys raised on the open range. In fact, some totally blind persons perform all the tasks involved without sighted assistance; also they can do much of their own carpentry work, such as remodeling buildings and constructing equipment);
2. The small amount of space required for raising turkeys in confinement makes it possible for many persons, with little capital and a small plot of land of inferior quality, to get a start;
3. There is less likelihood of losses from predatory animals, thieves, parasites, and soil-borne diseases such as blackhead; and
4. Turkeys are well protected from the weather.

The chief disadvantages, as compared with raising on the range, are:

1. Higher cost for feed and equipment;

Raising Turkeys in Confinement (Contd.)

2. More trouble from breast blisters, feather picking, and foot and hock deformities; and
3. More difficulty in supplying a well-balanced diet.

B. Points Necessary for Success in Raising Turkeys

1. Try to locate near a good market. This may be near a village, a town, or city, and should always be accessible to buyers of live turkeys.
2. Since turkey production requires a high investment per bird, make careful inquiries as to the different types and sources of loans available for financing the production phases and marketing operations.
3. Before building any production or marketing facilities, make a decision as to whether turkeys will be sold alive only, or whether an investment in processing equipment would be wise.
4. Determine the kinds and classes of turkeys wanted by buyers of both live and processed turkeys.
5. If processing is to be done, try to locate on a busy highway.
6. If the annual volume is as large as 2,000 birds, consider the use of a picking machine.
7. Become acquainted with existing Federal, State, and municipal regulations which pertain to processing, transporting, selling, and other applicable operations.
8. Discuss all plans in detail with the county agricultural agent and turkey marketing specialists in the State college of agriculture. Avail yourself of the benefit of their experience.

C. Locality

In general, it may be said that turkeys are grown successfully in practically every part of the country, as they stand both heat and cold and high and low altitudes, provided they are given adequate seasonal shelter from winter weather, dampness, and summer heat.

Turkey projects are being conducted in small towns, in the vicinity of large cities, in remote rural areas; on general farms, on large farms, and on ranches where flocks of from 5,000 to 60,000 are grown.



Raising Turkeys in Confinement (Contd.)

The important areas of production now are the Middlewest, the Pacific Coast, and the Middle Atlantic States, where turkeys are raised for the most part on the open range.

Raising turkeys in confinement (off the ground—on wire, slats, or pebbles) is practiced to a large extent in the extreme East and the New England States. However, the system is increasing in popularity and is extending to all parts of the country.

D. Housing

There are many different styles and types of housing that turkey growers have found to be convenient and adequate for their use. Anyone contemplating going into the business, should consult the county agricultural agent for advice regarding appropriate housing for that particular area. He should also write the poultry division of the Agricultural College in his State, and the Bureau of Animal Industry, U.S. Department of Agriculture, Beltsville, Maryland, for information and drawings to use as a guide in planning the purchase or construction of housing.

Frequently, there is unused space in a barn, garage, or other out building that may be remodeled for storing feed or brooding poult; therefore, eliminating the cost of erecting new and expensive quarters. Regardless of the building utilized or the space occupied, the feed supply, brooders, and rearing pens should be arranged in such a manner as to eliminate unnecessary travel and retracing of steps in the process of the daily work.

Feed should be stored where it is dry and protected from contamination by rats and other rodents, because molded feed causes many illnesses among turkeys and all rodents are carriers of disease. The storage space required will depend upon the availability of the feed and frequency of delivery. A small storage space of approximately 100 square feet is a convenient size for most projects.

1. Brooder Houses

The following information was taken from "Turkey Management" by S. J. Marsden and J. H. Martin.

Elaborate housing is not required anywhere in the United States for successful turkey management. During the brooding period when birds are raised artificially, all that is needed is a brooder house which can be heated to a floor temperature of about 70° F.

### Raising Turkeys in Confinement (Contd.)

In warm climates the construction may be cheaper than in cold climates. Turkeys brooded in advance of the normal season may require better housing than those brooded in the normal spring season. The general principles of brooder house construction for all kinds of poultry may be applied to turkey brooder houses. A warm dry floor, ample light, sufficient ventilation, protection from vermin, tight walls, and a roof that will retain the heat and protect against the weather, are the requirements. Interior fixtures required are: Brooder, roosts, water fountains, feeders, wire-covered platforms for feeders and waterers, and litter or wire floors.

Portable brooder houses are constructed of wood or composition board and placed on skids. If use in sub-freezing temperature is contemplated, the floors should be double-boarded with building or tar paper between the layers. The walls are usually single boarded with tight-fitting material. The roof is commonly made of boards and composition roofing, or less frequently, of metal or plywood. A house 10' by 12' or 9' by 14' is satisfactory in size. Brooder houses much larger cannot be moved readily and houses much smaller are not economical. These sizes will carry about 180 poults for the first 8 weeks.

## 2. Confinement Quarters

The following information on confinement quarters and materials was taken from Farmers' Bulletin No. 1409, U.S. Department of Agriculture:

For large-type turkeys the entire confinement quarters should supply about 7 square feet of floor space per tom and about 5 per hen, or an average of about 6 for both sexes raised to market age. Medium-sized varieties should have about  $5\frac{1}{2}$  square feet; and small-type turkeys about 5 square feet per bird in mixed flocks. On this basis, a platform 20' x 35' containing a roofed-over section 16' x 20' will provide rearing quarters for about 100 male large-type turkeys, or 140 hens, or 115 of both sexes. However, many growers are successful when only about 4 square feet of floor space is provided per bird.

Necessary equipment consists of a shelter attached to or made part of a rearing platform, with feeders, waterers, and roosts. Rearing platforms should be built up off the ground at least 4', and preferably, 6' to 8' to allow

Raising Turkeys in Confinement (Contd.)

space underneath for cleaning. Ground with a fairly steep slope frequently is chosen, as the building can then be firmly anchored close to or on the ground on the one side; and the slope permits easy cleaning, natural air, and water drainage.

Supports for the shelter may be made of concrete or treated wooden piling, topped with a floor framework of rough-sawed, 2- by 6-inch material for the outer edges, and 1- by 6-inch lumber placed 2 feet apart for the inside framework. Another method is to use planed 2-by-6's, set parallel 24 inches apart, resting on braced 3- by 8-inch girders. The 2-by-6's support the floor wire or slatted flooring material with a minimum of cross supports. Beveling the top edges a little to present a top surface of three-fourths inch is a help in sanitation, but is not essential. Beveling to a sharp edge is undesirable. Growers, living in wooded areas, may use poles and saplings; therefore, eliminating purchasing expensive milled lumber.

### 3. Floor Materials

The kinds of materials best suited for floors are:

- a. One-inch square clear fir, cypress, or oak slats placed one inch apart;
- b. One-by four-inch mesh electric weld, galvanized; 11-gage wire laid smoothly and the joined strips laced at the selvage with 12- to 14-gage plain galvanized wire, or with hog rings placed at close intervals. The wire should be nailed or stapled with poultry-wire staples at least 1 inch long to the outer edges of the platform, but not to the center supports, since this tends to break the wire.
- c. Other satisfactory floor materials are: (a) wooden boards 1-1/4" square; (b) 1" by 1-1/2", or 1" by 2" boards, laid flatwise 1-1/4" apart; (c) 1" by 2" mesh, 11- to 12-1/2-gage, welded wire; (d) 1" square mesh, 14-gage, hardware cloth; or (e) 1" to 1-1/2" hexagonal mesh, 14- to 16-gage, fox wire.

Floors made of slats are more durable than those made of mesh wire. They are less conducive to foot and leg trouble; therefore, are better for large turkeys.

Frequently the inside covered portion of the platform is floored with wire, while the outside open portion is floored with slats. They are easier on the feet of the birds and provide a



Raising Turkeys in Confinement (Contd.)

better walking surface for the attendant. This is important, especially if feeding and other activities are carried on inside the confinement quarters.

#### 4. Sidewall Material

Sidewalls of the rearing platform should be from 6' to 7' high. Ordinary heavy weight, square mesh, poultry fencing is the most practical material for the sidewalls, though 1-1/2" hexagonal mesh, 18-gage, or 2" mesh, 16-gage netting, is very good.

When feeders and waterers are hung to the sidewall, various sized grills, 12 inches high, should be placed in front of each feeder or waterer to accommodate the various size turkeys as follows: welded wire grills, slatted grills with openings 2" and 3" wide, or narrow space grills, which are adjustable.

For use in severe weather, the roosting section usually is boarded up on three sides. Adjustable openings that can be closed in stormy weather and opened in warm, should be made in the rear wall. This system will supply good ventilation and light, and encourage turkeys to use the roosts. In moderate and warm climates, the roof is sufficient and there is no need for sidewall protection.

The top of the open portion of rearing platforms may be left open. However, better protection is given if it is covered with medium weight poultry wire. When the top is left open, the sidewalls should be 7' high, and the flight feathers of one wing of the turkeys clipped, or the last joint cut off. (Reference page 63, Farmers' Bulletin 1409, United States Department of Agriculture.) Some growers have found it unnecessary to clip the turkeys' wings when using a 6' fence, provided a slanted-in, woven-wire antitfly is added to the top.

#### 5. Roofing Material

The roofed over section of the rearing pen can be covered with a number of different materials: over-lapping boards; galvanized metal or aluminum roofing; paper over sheeting; or any of the newer processed roofing materials which require no supporting sheeting.

In all instances, the roofing must have proper support and adequate pitch. It should provide 12 linear inches of roosting space per bird for small, 13-1/2 inches for medium, and 15 inches for large type turkeys. When birds are to be

Raising Turkeys in Confinement (Contd.)

reared in climates having severe weather, additional space, which is sufficient for the turkeys to use feeders and waterers, should be provided.

6. Roosts - Construction and Materials

Roosts may be built in the center of the rearing platform or against the edge. If placed in the rear of an enclosed shelter, openings that can be closed in bad weather and opened in mild weather should be provided. Low roosts are a necessity with large broad-breasted turkeys and high roosts are desirable with other types. They should all be built on the same level with their tops 4- to 6 inches above the floor. If it is necessary to have the tops of roosts more than about 8 inches above the floor, it is an advantage to nail strong wire, preferably 2- by 2-inch square mesh 14- to 16-gage, or 1-1/2-inch hexagonal mesh 16-gage, loosely over the tops of the roosts or tightly to their undersides to support the birds and thus prevent bruising and other injuries. Welded wire 2- by 4-inch mesh, 12-1/2- to 14-gage, may also be attached to undersides of the roosts, or slats may be used between the roosts, for this purpose. With this arrangement, the roosting section would not require any floor wire or slats--the wire on top or underneath, or the slats between the roosts, serve the purpose of the wire or slat floor. Wire or slats on top of or attached to bottom surface of the roosts are self-cleaning, whereas, materials placed 5 inches or a greater distance below the top surface of the roost are not.

E. Selecting a Variety

There are two classifications of turkeys--the Standard, which is a large bird, and the Non-Standard, which is considerably smaller. The variety should be chosen on personal preference, market demands, and general adaptability to each situation; and the strain possessing the characteristics best suited to the purpose, for which the turkeys will be used, should be selected.

Six standard varieties, popularly called breeds, of domesticated turkeys are recognized by the American Poultry Association, an organization having as its primary function the standardizing of varieties of poultry in North America. The Association publishes the Standard of Perfection which contains concise descriptions of breeds and types of poultry.

Raising Turkeys in Confinement (Contd.)

## 1. Standard Varieties

The Bronze.--The Bronze is the heaviest standard variety; toms weighing approximately 22 pounds, and hens 13 pounds at market age of 28 weeks. Its skin is creamy white, or yellowish white if pigment-producing feeds, such as yellow corn, are eaten in large quantities.

The White Holland.--The White Holland is medium in size; toms weighing approximately 20 pounds, and hens 12 pounds at market age of 28 weeks. It originated from the Bronze or the wild turkey; its skin is white or yellowish white.

The Bourbon Red.--The Bourbon Red is medium in size; toms weighing approximately 20 pounds, and hens 12 pounds at market age of 28 weeks; its skin is white or yellowish white.

The Narragansett.--The Narragansett is a medium-sized variety; toms weighing approximately 20 pounds, and hens 12 pounds at market age of 28 weeks. The skin is white or yellowish white as in the other varieties. Young Narragansett poultts resemble Bronze poultts and cannot be distinguished from them.

The Black.--The Black is a medium-sized variety; toms weighing approximately 20 pounds, and hens 12 pounds at market age of 28 weeks. It is known in England as the Norfolk turkey. The skin is white or yellowish white.

## 2. Non-Standard Varieties

The great majority of turkeys now raised in the United States are the non-standard varieties, the Broad Breasted Bronze, and the Beltsville Small White being outstanding examples.

The Jersey Buff.--The Jersey Buff is medium small in size; toms weighing 13 to 18 pounds, and hens  $8\frac{1}{2}$  to 11 pounds at market age of 24 to 26 weeks. It was developed through pedigree breeding and selection from crosses of Black, Bourbon Red, and Broad Breasted Bronze at the New Jersey Experiment Station, Millville, New Jersey; and is about 10 percent heavier than the Beltsville Small White at all ages. The light-colored pinfeathers are inconspicuous in the dressed bird.



Raising Turkeys in Confinement (Contd.)

The Beltsville Small White.--The Beltsville White is a small turkey; toms weighing 12 to 17 pounds, hens 7-1/2 to 10 pounds at market age of 24 to 26 weeks; also about 1/5 to 1/4 more turkeys may be raised with the same equipment and labor. This variety was developed by poultry scientists at the experiment farms of the United States Department of Agriculture, Beltsville, Maryland. It is identical in color with the White Holland but is smaller and is fast becoming popular with the buying public. It has a compact body, long keel bone, and abundant meat on breast and legs, and is suitable for small families and small ovens. Its white feathering is a further asset since white pinfeathers, when present, detract less than dark ones from the appearance of dressed birds.

The Charlevoix.--The Charlevoix is a small-type Bronze about the size of the Jersey Buff; toms weighing 13 to 18 pounds, and hens 8 1/2 to 11 pounds at market age of 24 to 26 weeks. It originated in Canada and is raised in limited numbers in that country.

The Royal Palm.--The Royal Palm is a new variety about the size of the Jersey Buff; toms weighing 13 to 18 pounds, and hens 8 1/2 to 11 pounds at market age of 24 to 26 weeks.

The Broad Breasted Bronze.--The Broad Breasted Bronze, although a non-standard variety, is a large turkey; toms weighing 22 to 24 pounds, hens 14 to 15 pounds at market age of 24 to 26 weeks. It is the most extensively used of all varieties; is distinctive for its body type; and yields about 6 pounds more of all lean meat per hundred pounds than other turkeys.

Of all these varieties the Broad Breasted Bronze, standard-bred Bronze, and crosses between them are by far the most popular, probably together comprising 90 percent of the turkeys in the United States.

All sizes and varieties of turkeys can be raised successfully and profitably in confinement (off the ground--on wire, slats, or pebbles). However, the smaller varieties are winning favor with growers using this system. With the small turkey there is less trouble with foot and hock deformities; a larger number can be raised in a given space; they can be marketed as broilers in 14 weeks, and mature as roasters in approximately two weeks less time; they meet the demand of small families and small ovens; and there is a market differential of from 5 to 15 cents a pound in their favor.

Raising Turkeys in Confinement (Contd.)

Persons desiring information and advice pertaining to the selection of a variety, which is most suitable for their purpose, should communicate with the county agricultural agent in the community where they are going to operate; describe the system they intend to use in raising turkeys; tell whether they plan to market live or dressed turkeys; and explain whether they intend to sell direct to the consumer or to the wholesale trade. From this background of information, the county agricultural agent will be able to give practical advice concerning the variety best suited for the type of project to be undertaken.

F. Care of Turkeys1. Brooding

The following information was taken from "Turkey Management" by S. J. Marsden and J. H. Martin.

A satisfactory brooding device should provide the following:

The temperature near the center of the hover, one inch above the floor, should be 100° F. Near the floor, at the edge of the hover, 95° F is desirable, and the floor temperature of the room should be kept at about 70° F.

Uniform heat regardless of outside temperature.

Controllable heat that can be adjusted to the demands of the birds at various stages and under varying weather and management conditions.

Safety from fire.

Ventilation under the hover and in the brooder room, sufficient to avoid wet litter and also meet the requirements of the poults for fresh air.

Reasonable first cost and reasonable operating cost.

Heat may be supplied by coal, wood, oil, gas, or electricity, the choice depending partly upon the relative cost and availability of the various fuels.

It would be well for growers to consult the county agricultural agent in the community, where they will operate, for advice as to the type of brooder best suited for their purpose.

Raising Turkeys in Confinement (Contd.)

A practical brooding unit is about 150 poults. Many operators brood from 180 to 250 or even 300 per unit, but it is better practice and less risky to limit the brood to 150. About 1 square foot of brooder-house floor, or floor and porch space, should be allowed per poult if the birds are to be brooded for about 8 weeks. In most instances, turkeys are transferred to the rearing pens, at about 8 weeks of age, where they live until marketing time.

Brooding time (1 day to 8 weeks) is a critical period for turkey growers, as the start, turkeys get, largely affects their future development. They must be kept warm, dry, free from draft, have good ventilation, be fed well-balanced rations, be carefully watched to make certain they learn to eat and drink properly, and the brooder house must be kept clean and sanitary at all times.

Many kinds of litter, such as straw, shavings, peanut hulls, shredded cane, and sand, are used with varying degrees of success. However, wire floors remove the need for litter and are a help in disease control. Where wire floors are used, sufficient space between the wire and the floor should be allowed for adequate ventilation.

Compared to chicks, poults are more difficult to brood. They do not learn to eat so rapidly; they are more subject to fright, crowding, and piling; they do not take kindly to changes in feed or equipment; and they are more easily chilled. The essentials of success in poult brooding are good equipment and eternal vigilance. Overcrowding is very dangerous, and large units over 175 poults, are more difficult to handle than small units. Ample feeding and watering space and sufficient heat must be provided. Getting the poults out into the sun-porches or yards is good practice, but it must be done carefully and the poults watched continuously. If quick and easy access to the brooding room and to the brooder itself is not provided, the poults may crowd together in the corners of the porch next to the house. Boards or wire may be used to guide the poults back into the house openings.

## 2. Feeding

Feed should be kept before turkeys constantly from hatching to market age, and should be put in hoppers or troughs; not on the floor.



Raising Turkeys in Confinement (Contd.)

For the first 24 to 72 hours after hatching, poults can live without feed or water, the yolk of the eggs which they have absorbed before hatching being sufficient to maintain them for that length of time. However, the sooner they are fed, the better; and in any event, they should be fed as soon as they are put into the brooder house, in order to prevent excessive eating of the litter. Poults kept from feed and water for much more than 24 hours after hatching learn to eat and drink with difficulty. It is common practice to see that the poults are fed and watered within 24 hours after hatching.

The first feed may be starting mash or crushed pellets (granules) upon which is scattered a little oatmeal or tender, finely chopped green feed. These materials should be placed in small heaps on clean boards, pie plates, or cup flats underneath the hover for the first day or two. Pelleted mash may be fed after the first 3 or 4 weeks, but poults do not take well to it at the start—they seem to prefer dry mash or granules. The feeding of liquid milk is not recommended for poults.

Although finely chopped tender green feed is good for poults in guarding against nutritional deficiencies and encouraging them to learn to eat, feeding it is usually impractical due to labor costs and difficulty in obtaining suitable types. Most turkey growers prefer to feed a complete starting mash so as to eliminate the necessity of feeding green feed.

Poults that will not or do not learn to eat and drink quickly may be saved by force feeding. Make a soupy mixture of regular starting mash with water or milk. Take the small end of a 25-cubic centimeter glass laboratory pipette in the mouth and by suction fill the pipette with the mixture. Open the poult's mouth, insert the large end of the pipette down the poult's gullet beyond the entrance to the lungs, then force out enough of the food to fill the crop comfortably. One such feeding usually is enough but two or more may be needed in stubborn cases.

Commercial starting mashes or "starters" in loose or granulated form are generally available; and in many localities, these are the only types of feeds obtainable. Ingredients necessary to make up good mashes may be available on the local market. In any case, the selection of a good commercial mash, or a good formula properly mixed containing high-quality ingredients, is necessary. Protein, mineral, and vitamin content are the main points to be considered. A standard starting mash or "starter" containing from 24 to 26 percent protein, or a high energy feed with 27 to 30 percent protein, is desirable.

Raising Turkeys in Confinement (Contd.)

Starting mash is recommended for feeding turkey poults during the first 8 weeks. This mash is a complete feed, needing no supplements except water and insoluble grit, such as granite, mica, coarse sand, or gravel, which may be hand-fed lightly on top of the mash. This starting mash should be fed along with clean water. Grain of the size fed to hens may be given with the mash starting at 6 to 8 weeks. Soluble grits, such as limestone, should not be fed. The mash in dry form should be kept before the poults at all times but stale mash should not be allowed to accumulate in the feeders.

Diets for growing poults after 8 weeks of age generally include both mash and grain. Keeping mash and grain before the turkeys at all times is the recommended method of feeding to promote normal growth and quick maturity. Usually special methods of fattening are not necessary--the birds being fed the regular growing feeds up to the time of marketing. Oats are a good fattening feed and usually are palatable to turkeys. Turkeys intended for dryers should be fed the mash and whole heavy oats starting at 6 to 8 weeks.

The following formula, if fed with insoluble grit and grain mixture containing at least one-third yellow corn and one-third oats, is a complete diet suited to turkeys reared in confinement without green feed, provided they have access to direct sunshine:

	Parts by Weight
Ground yellow corn .....	28
Wheat middlings or shorts.....	15
Alfalfa leaf meal or alfalfa meal con- taining 17 percent or more protein, dehydrated preferred.....	15
Soybean meal.....	15
Sardine fish meal.....	6
Wheat bran.....	6
Steamed bonemeal.....	6
Meat scrap (50 or 55 percent protein)	5
Ground oystershell or limestone.....	2
Riboflavin concentrate.....	1
Salt, fine sifted, preferably man- ganized.....	1
Total.....	100

Raising Turkeys in Confinement (Contd.)

Whole corn is not eaten liberally by turkeys under about 18 weeks of age; hence should be cracked and cleaned (freed of meal) when fed prior to that age. Rye, buckwheat, and rough rice are satisfactory feeds for use after turkeys are 8 weeks old, but should be fed in limited quantities and in combination with one or more of the common grains, such as corn, wheat, oats, or barley.

Feeding of two or more grains is good practice and does away with mixings. This is an advantage, especially where home-produced grains are fed. Cost and availability should determine the kinds of grains fed, as all have about the same value in turkey growing and fattening diets. From 9 weeks to marketing, supply a growing mash and grain. Records of feed consumed by large- and small-type turkeys, over a period of 24 weeks, show that 4 to 6 pounds are required to produce one pound of turkey meat.

During the last six weeks before marketing, turkeys should not be moved long distances or subjected to radical changes in management or feeding, as this might slow down the finishing process.

### 3. Cleaning

The following information was taken from "Turkey Diseases" by Hinshaw and Rosenwald; "Turkey Raising" by Marsden; and "Turkey Management" by Marsden and Martin:

Keeping housing and equipment clean and sanitary is the keynote to success for all turkey growers. Brooder house floors should frequently be cleaned, scraped, swept out, and then scrubbed, using water (preferably hot) containing a 13-ounce can of lye to 13 gallons of water. Reliable disinfectants such as coal-tar products i.e., cresol solution, may be sprayed on the floor and sidewalls. All equipment used for brooding should first be cleaned thoroughly.

All litter including droppings should be hauled to a place where turkeys cannot get at it. Infection and fly trouble can be reduced by composting or spreading the litter in the sun away from turkeys.

All movable equipment should be removed to a cement run or a cleaning platform for proper cleaning and disinfecting.



Raising Turkeys in Confinement (Contd.)

The walls, floors, and built-in equipment should be scrubbed with lye solution (1 can, or 13 ounces, to 20 gallons of water). Apply with an old house broom. Care should be taken by the worker not to get solution on hands, face, or clothes. Vinegar is an antidote. Time should be allowed for thorough drying before poults are put in the house. Lye is too corrosive to use as a spray on plaster or concrete, but is excellent for disinfecting wooden or metal (except aluminum) equipment.

Feeders and waterers should be made contamination-proof. All feed and water pans should be on wire platforms or on wire floors, if possible. The area around water pans should always be dry. All waterers should be kept clean by daily washing with brush or cloth followed by rinsing in clean water. Occasional disinfecting with chlorine or quarternary ammonium disinfectants, sodium orthophenylphenate solution, or other disinfecting solution not leaving a strong odor, may be used if disease is present. However, cleanliness alone is usually sufficient.

Feed troughs must be protected from contamination by keeping them covered with wire or slats having openings sufficient to permit turkeys of various ages to eat. They should be hung high enough from the floor so that the feed will not become contaminated with litter or droppings. Sour feed should never be allowed to remain in the feeders. Receptacles for milk should be washed and scalded daily. For poults only a few days old, feeders should be of wood strips similar to house laths or flat metal receptacles such as pie plates. The wood strips should be disposed of and replaced frequently, and the metal receptacles sterilized daily.

If no disease is present, feeders may be put on a cement floor or cleaning platform, washed with soapy water, rinsed with hot water, and dried thoroughly in the sun.

If a disease is present, feeders should be washed in soapy water and rinsed; then rinsed thoroughly in boiling water and sprayed with live steam or dipped in a 1 percent solution of formalin; or sprayed with, or dipped in sodium orthophenylphenate or a quarternary ammonium compound, diluted as directed on the package.

Raising Turkeys in Confinement (Contd.)

Be sure to disinfect equipment, shoes, and overshoes, which have been used in a contaminated pen, before entering a clean compartment; or, after they have been used in a pen of older poults before using them in a pen of younger ones. Apply one of the general disinfectants (lye solution, sodium orthophenylphenate, compound solution of cresol, sheep dips).

The wire or slatted floors of rearing pens and all roosts should be kept thoroughly clean; and may be washed down with a garden hose, and scrubbed with a stiff broom or brush, when necessary. All droppings beneath the floor of the pens should be removed at close intervals and disposed of by spreading in the sun to dry or being decomposed in a compost pit or cabinet.

Feed storage houses should be dry and rodent-proof, to prevent illness among turkeys. Cleanliness alone will not eliminate illness or disease in a flock of turkeys, but it will do much to prevent trouble. Growers must expect a certain amount of disease and mortality; but it is better to prevent and control an outbreak in a flock than to try to cure sick turkeys. Diseased birds should be sent to the laboratories of the State experiment farm for diagnosis. The services are free and there is no excuse for guesswork. Dead birds should be disposed of by burning to prevent spread of disease.

#### 4. Feather and Flesh Picking

Feather picking is a mild form of cannibalism to which turkeys are very susceptible during the growing period, especially after they are about 12 weeks of age. It results in unsightly appearance, and more trouble from pinfeathers when the birds are marketed.

Feather picking is more serious when birds are raised in confinement. It may be prevented, or stopped completely, by "debeaking," or by a specially made turkey bit resembling a 1-1/4 inch hog ring hanging between the two jaws and adjusted to fit snugly in the nostrils of the turkey without penetrating the septum between them. This device prevents the beak from being closed completely, thus preventing feather picking. The "debeaking" should be done, or the bit applied when the trouble starts, usually at about 12 to 14 weeks of age.

Raising Turkeys in Confinement (Contd.)

Management practices that tend to prevent feather picking are: (1) Placing tightly stretched 11- or 12-gage wire on the feeders for beak cleaning; (2) avoiding overcrowding in confinement rearing; (3) providing 3-1/2 to 4 inches of feeder space per growing turkey, rather than the minimum allowance; (4) feeding an adequate diet; (5) feeding pelleted mash instead of mash in dry form; (6) feeding whole oats in fairly large proportion—about 50 percent of the grain portion of the standard mash-grain diet; and (7) not confining turkeys to roosts or restricted quarters, particularly in the early morning.

Head and neck picking occasionally results from fighting. Fighting usually is not serious among turkeys, provided injured birds have ample opportunity to escape.

Pine tar or chick-pick remedies, such as a mixture of 4 ounces of petrolatum, one-fourth ounce of carmine, and one-fourth ounce of aloes applied to the affected areas, offer temporary relief from picking.

#### 5. Diseases, Pests, and Common Ailment

Information on this subject was obtained from Farmers' Bulletin No. 1409, "Turkey Raising," and Farmers' Bulletin No. 1652, "Diseases and Parasites of Poultry;" "Turkey Management" by Marsden and Martin; and "Starting Right with Turkeys" by G. T. Klein.

At the slightest indication of disease, growers should consult the county agricultural agent for advice; and, irrespective of sight, the services of a veterinarian should be obtained, since the diagnosis and treatment of disease require special knowledge, skill, and experience.

The best way to fight disease in turkeys is by prevention and control; not by trying to cure sick birds. Not too much is known about how to care for a turkey once it gets sick; therefore, growers must expect some mortality.

##### a. Prevention

Disease prevention is too often thought of only in terms of impractical cleanliness. In practice, no one expects the poultry house to be spotlessly clean and free from germs. Cleanliness alone, although vitally important, will not prevent all disease.



Raising Turkeys in Confinement (Contd.)

Listed are some of the weapons and a plan of action poultrymen can use to prevent and control disease, parasite, and vice outbreaks in their flocks. They were taken from a reliable poultry manual published by a manufacturer and distributor of poultry feeds and insecticides. Each has its important place in the practical disease control program, and includes:

(1) Seven Weapons To Combat Disease---

- |                              |                  |
|------------------------------|------------------|
| (a) Blood testing breeders   | (e) Vaccines     |
| (b) Common sense cleanliness | (f) Insecticides |
| (c) Complete nutrition       | (g) Drugs        |
| (d) Mechanical devices       |                  |

(2) A Plan of Action to Keep Disease and Mortality at a Low Level--

- (a) Buy poults from a hatchery having pullorum-free breeding stock only; a sound sanitation program; and one that controls breeding flocks supplying its hatching eggs.
- (b) Get poults in new boxes and use feed from new bags.
- (c) Keep brooder and laying houses clean and dry.
- (d) Allow no mudholes, piles of trash, boards, or manure around poultry houses.
- (e) Keep unnecessary visitors out of your poultry houses.
- (f) Don't wait for a seriously sick poult to die--get rid of it at once.
- (g) Burn or bury all dead birds immediately.
- (h) Keep poults away from growing turkeys.
- (i) Vaccinate against fowl pox, Newcastle disease, and bronchitis if they are a threat in your area.
- (j) Keep poultry houses free of lice and mites.
- (k) Rats, insects, and wild birds should be kept out of poultry houses.

Raising Turkeys in Confinement (Contd.)

- (l) Use drugs where they effectively help prevent or control disease. Remember, no drug is a "cure-all".
- (m) Feed is important in any disease prevention program. Follow the recommended feeding program that fits the needs of your flock so your birds will be fortified with the good health that comes from complete nutrition.

## b. Common Diseases

In this section is listed some of the most common diseases, pests, and ailments affecting turkeys. Each is described according to its nature, symptoms, cause, and method of treatment.

Blackhead.--Blackhead is primarily an infectious disease which attacks the ceca and liver of turkeys; and may occur at any time in the life of a turkey, but is most serious in young birds. The fact that the head of the affected bird may become discolored has given it its popular name, blackhead.

Symptoms--Drooped wings, drowsiness, ruffled feathers, weakness, loss of weight, and sometimes a sulfur-colored diarrhea are the main symptoms. Death is often sudden. The discoloration of the head is seen also in other diseases and is not always present in this disease, so that the term "blackhead" is not a very satisfactory one. Post-mortem examination will show the liver to be enlarged and often spotted with dark red, gray, or yellow circular areas.

Cause--The parasite (*Histomonas meleagridis*) causing blackhead is one of the protozoa. The organisms live part of the time free in the cavity of the ceca or blind pouches; but in another stage of the disease, they apparently enter the walls of the ceca and are probably carried through the blood stream to the liver. The organisms in the ceca multiply in large numbers and pass out in the droppings. When the eggs from the droppings are eaten, in contaminated feed or water, and hatch in the intestinal tract, the blackhead organisms are transmitted to the bird and set up the disease.

Treatment--Although many drugs have been tried and some are recommended for the treatment of blackhead, none have been found to be of practical use. Control measures by disinfection of premises and by isolation of sick birds, to prevent development of the disease, is the only practical procedure.

Raising Turkeys in Confinement (Contd.)

Coccidiosis.---This disease is less severe in poults than in chicks, and if observed in time can be checked with less setback to the flock. Coccidiosis makes its appearance in poults from 5 to 16 weeks of age, although occasionally as early as 3 weeks. It is more common in poults, naturally brooded, as the mother hen serves as the source of infestation. The species which infect turkeys are different from those commonly troublesome to chickens, so cross-infection does not occur.

Symptoms---Drooped wings, ruffled feathers, listless appearance, diarrhea light brown and mucoid rather than bloody, although blood occasionally appears as the disease continues to run its course.

Cause---Infestation with parasitic organisms, especially of the genus *Eimeria Meleagridis*, a one-celled protozoan. The organism multiplies in the bird's body, so that considerable numbers of the parasite are later passed in the droppings. As a result the infection is spread to other birds. The organism may be carried or spread by flies, birds, insects, rats, and mice.

Treatment---The drug sulfagaunidine recently has been found to possess curative properties. It is administered at the rate of 0.5 percent in the dry mash for two or three consecutive days, water but no other feed being given. This treatment is sometimes given as a preventive, during the fourth or sixth weeks of brooding, in situations where coccidiosis threatens the flock.

Pullorum.---Pullorum is a destructive, typically diarrheal disease, formerly called bacillary white diarrhea; and is widespread, existing in every section of the United States where appreciable numbers of poultry are raised. The disease is usually acute, with losses up to 30 to 50 percent or more. The most susceptible age is from the first week through the third week, although heavy losses have been experienced as late as three months of age.

Symptoms---Droopiness, huddling together in warm places, ruffled plumage, skin on legs dry and wrinkled, and listless picking at feed. In cases not so acute, there is often a pasting up around the vent and labored breathing which indicates infection in the lungs. The droppings may be whitish, foamy, and sticky.



Raising Turkeys in Confinement (Contd.)

**Cause**--The disease is caused by a germ which is known as *Salmonella pullorum*. The organism may be transmitted in the egg or by contaminated food and water. Although the germ is quite easily destroyed by direct sunlight, heat, or disinfectants, it may remain alive in soil or manure in sheltered places for many days, or even months. The primary seat of pullorum infection is the ovary of the infected hen.

**Treatment**--The sulfa drugs have been reported as successfully used to prevent death losses from pullorum disease. Pullorum control involves obtaining eggs from disease-free flocks; hatching them in disease-free incubators separately from chicken eggs; and brooding and rearing the poults away from chickens, infected turkeys, and contaminated land or equipment. Blood testing of breeding stock is essential to an effective control program. Cleanliness and sanitary conditions are the most effective means of combating the disease.

**Erysipelas**.--This disease, though uncommon, may cause heavy losses in turkeys, mostly males, near market age. It is caused by the swine erysipelas organism, *Erysipelothrix rhusiopathiae* transmitted by sheep or swine.

**Symptoms**--Listlessness, drooping, aloofness, cyanotic (dark blue) head, nasal catarrh, swelling of the snood which may fall off, and fevers of 2 to 3 degrees.

**Treatment**--Affected birds may be saved by prompt injections of penicillin in proper dosage; 20,000 units of oil, 4 doses given 24 hours apart. Streptomycin (a single dose of 140,000 mcg.) proved 100 percent effective, while 80 percent of the untreated died, in a test by C. C. Grey (1947).

**Caution**: Erysipelas is transmissible to humans and may cause an itching rash on the skin.

**Newcastle Disease**.-- Newcastle disease, also known as avian pneumoencephalitis, is a highly contagious virus disease involving, primarily, the respiratory and nervous systems of domestic fowl. It is characterized by a sudden onset and extremely rapid spread through a flock. Turkeys are very susceptible. The time between exposure and appearance of symptoms may vary from 2 to 14 days. The average time is generally considered to be

Raising Turkeys in Confinement (Contd.)

about 5 days. The disease may be spread by direct or indirect contact. It may be carried from one farmyard to the next by visitors, such as poultry buyers, feed deliverers, and remedy salesmen. The practice of feed dealers of collecting used feed bags and reusing them causes some outbreaks of the disease. The virus may survive on infected premises for 2 or 3 weeks following an outbreak of the disease; and it is recommended that poultry houses be vacated for at least 30 days before being restocked.

Symptoms--Newcastle disease begins with respiratory symptoms resembling those of infectious bronchitis and larynogotracheitis. The first symptom observed is difficult breathing accompanied by gasping. Some turkeys emit a peculiar shrill cry which may be heard above the other sounds in a poultry house. The birds are visibly depressed and weak. A few days after the respiratory symptoms appear, nervous disturbances are encountered. The birds may lie on their sides, with paralysis of one or both legs or wings. The equilibrium is altered so that birds may do somersaults, turn over backwards, walk backwards, or twist the head and neck into all sorts of contortions. Tremor of the head is common.

Treatment--Medicinal treatment is of no value in this disease. Approved methods of poultry management should be followed to avoid introduction of the disease into a flock. Recovered birds may become carriers of this disease. Admission of visitors from potentially infected premises should be avoided.

c. Common Pests

Lice.--Four species of lice are found on turkeys. The large louse (*Gonoides meleagridis*) and the slender turkey louse (*Lipeurus gallipavonis*), are restricted to the turkey and may be markedly injurious to poults and may also cause severe annoyance to adult birds. The common body lice are found on both turkeys and chickens and may cause considerable irritation to both young and grown birds. The shaft louse may be present without evident bad effect. High mortality among hen-hatched or hen-brooded poults may result from infestations of head and body lice.

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Symptoms—Young poults fail to grow normally; mature birds may be in poor flesh. Lice may be seen easily by examining the upper thigh feathers and the bases of the fluff feathers below the vent. The unhatched whitish louse eggs (nits) may be seen in clumps about the base of the feathers. Some kinds of lice breed on the bird's body feathers, others on the head; young and old lice remain on the turkeys. Lice are yellowish to grayish in color, about 3/16" in length.

Treatment—Apply sodium fluoride among the feathers, working it well down to the skin, one pinch at a time on the head, the neck, the back, under each wing, below the vent, above the vent, and in the long fluff feathers on each side. Baby poults should not be dusted with sodium fluoride or any strong louse powder until more than a week old, and even then the powder should be applied sparingly. If turkeys are roosting in a house, lice may be controlled by applying a thin line of nicotine sulphate solution on the top surface of all roosts. Where a general delousing is needed, this method is effective and easily administered. Control of lice involves the destruction of the parasites and nits (1) on the birds themselves, and (2) in the house and litter.

Mites.—Red mites often flourish unsuspected in turkey roosting or nesting quarters, which should be inspected periodically. Their presence is indicated by grayish deposits or by the tiny mites themselves, which are red after feeding on the turkey's blood.

Symptoms—Loss of vitality and color indicate a loss of blood due to mites. The scaly-leg mite crawls under the scales of the shank causing the entire shank to appear rough, and the bird sometimes become crippled.

Treatment—Paint the underside of the roosts and roost supports with anthracene oil, crude oil, crankcase oil, or any coal tar disinfectant. Make the application light but thorough, and do it preferably in the morning.

Ticks.—The fowl tick, or blue bug, is one of the worst pests of turkeys in the warm sections of the country. It is a large insect resembling a bedbug, and can be controlled by the methods advised for controlling red mites, but the treatment must be thorough and persistent.



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Worms.---Turkeys are subject to attack from various species of roundworms, tapeworms, flukes, gapeworms, and gizzard worms. Treatment should not be undertaken until the presence and identification of the worms have been determined by examining the droppings or by post-mortem examination. Worm infestation can be prevented by sanitation and by the control of intermediate hosts, such as flies, grasshoppers, beetles, and other insect carriers.

Symptoms---Loss of weight, sagging wings, paleness, and occasionally diarrhea. However, birds may be fairly heavily infested and yet appear healthy. In most sections of the United States worms do not infest turkeys to any serious extent; yet in a few areas they may be troublesome. The ripened eggs pass through the droppings, incubate in the soil and litter, and soon infest other turkeys.

Treatment---Four percent of tobacco dust ( $1\frac{1}{2}$  percent nicotine) in the mash, fed continuously, is considered to be an effective control; however, any sanitation program that will avoid trouble from blackhead usually eliminates roundworm infestation. The use of worm remedies without a competent post-mortem examination, to prove the presence of a serious worm infestation, is to be discouraged.

Manson's Eye Worm.---The parasite (*Oxyspirura mansoni*), known as Manson's eye worm, infests chickens, turkeys, and peafowls, and can develop in various wild birds. This worm has an indirect life history, and its intermediate host has been shown by workers of the Florida Agricultural Experiment Station and elsewhere to be a cockroach. The cockroaches are found beneath boards, trash, and in the vegetation at the edges of fences; they feed on whatever food is present, including droppings of the fowls. From the droppings, the cockroaches obtain the eggs or newly hatched larvae of the roundworms, the eggs having been washed down the tear ducts from the eye of the fowl and having then been swallowed and passed in the droppings. The young roundworm develops in the body of the cockroach; and when the roach is eaten by a fowl, the worm is freed in the bird's crop. It passes up the esophagus to the mouth and then through the tear ducts to the eye.

Symptoms---Affected bird winks the eye continuously and frequently attempt to rub the head on the feathers of the wing, or to scratch at the eye with the foot. The eyesight is not good. There is puffiness around the eye and

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a discharge from the eye and from the nostrils. Often a severe inflammation may result in blindness; at times, the entire eyeball is destroyed.

Cause—The parasite, *Oxyspirura mansoni*, is found under the nictitating membrane, i.e., the transparent membrane which passes over the eyeball of the fowl in the act of winking. The worms are slender, colorless, and about  $3/4$  of an inch long. They can often be detected by a firm pressing of the tear sac at the inner corner of the eye, when they will wiggle out over the eyeball.

Treatment—Two or three drops of a 5 percent solution of butyn should be dropped in the eye as an anesthetic. The transparent membrane should be lifted to place one or two drops of a 5 percent solution of liquor cresolis on the worms. The eye should then be washed well with warm water.

d. Common Ailment

Bumblefoot.—Bumblefoot in turkeys is abscesses of the foot pads. The ailment is seldom serious except in Broad Breasted Bronze. Bumblefoot may be confused with Staphylococcosis, a bacterial infection that sometimes causes swollen feet.

Symptoms—The abscesses have the appearance of corns. They are boil like infections and the bottom of the feet may be swollen. In severe cases the infections look like foot rot in other animals. The birds are lame. Growth is retarded and the weight reduced.

Cause—The real cause is not known. The probable cause is bruising or cutting of feet followed by an infection. Floors with rough edges and projecting points may result in moderate bumblefoot in all turkeys and serious bumblefoot in Broad Breasted Bronze.

Treatment—There is no cure for bumblefoot once it develops. If the birds get abscesses, put them in dry clean quarters and treat the pads with tincture of iodine or an antiseptic healing ointment such as ammoniated mercury or sulfa.

Floors made of poles or slats, having round edges, and roosts low enough to prevent bruising of feet when the birds hop to the floor, have possibilities in the prevention of bumblefoot.

Raising Turkeys in Confinement (Contd.)G. Methods Used by Blind Persons in Detecting Signs or Symptoms of Disease and Minor Ailments in Turkeys

To obtain accurate information on conditions which are warning signals of approaching trouble, contacts were made with turkey growers, both blind and sighted; county agricultural agents; veterinarians; specialists; and pathologists from the U. S. Department of Agriculture.

Whether blind or sighted, it is vitally important that turkey growers be able to detect the first signs of disease in their flocks, in order that they may administer treatment to prevent the outbreak from becoming widespread and financial loss serious.

Naturally, totally blind persons and persons with seriously impaired vision have difficulty in detecting the symptoms of certain kinds of illnesses and must rely, to some extent, upon sighted help for information. It is for this reason that arrangements should be made for someone, such as a sighted member of the family, a neighbor, or a supervisor provided by a feed dealer, to look the flock and premises over, at frequent intervals, and advise the blind person regarding their condition. In all instances, even though sighted assistance is provided, the services of the county agricultural agent are of vital importance; and arrangements should be made for him to make regular inspection tours and advise the blind operator regarding the condition of his flock, in order that he may follow the best practices and use the proper methods to prevent disease.

#### 1. Conditions

In the raising of turkeys for meat, there are two definite conditions that indicate approaching trouble and can be identified by sound or touch.

Inactivity.--Healthy turkeys are alert and active. They cheep, chatter, eat well, run and jump to catch insects, and fly at the slightest disturbance. The absence of any of these traits is an indication of trouble.

It is difficult, of course, to detect these symptoms in a few turkeys when a person is attending to a large flock. However, it is the experience of blind poultrymen that, even when a few turkeys become inactive, fail to respond to fright, and squat listlessly in the pen, the attendant usually locates them with his feet. With these warning signals, a blind person will know to call the



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county agricultural agent, or a veterinarian to analyze the difficulty and administer such treatment as may be necessary to prevent, or at least, lessen the seriousness of disease in the flock.

Decrease in Feed Consumption.--Good poultrymen carefully weigh and apportion the quantity of feed to be consumed daily by their flock. When the birds fail to eat all of the feed, it is an indication of approaching trouble. The blind poultryman, of course, easily detects this condition by running his hand into the hopper containing the feed.

One county agricultural agent has the following to say:

"Feed consumption usually drops one or two days before outward symptoms of sickness are noticeable. By measuring just the right amount of feed needed each day and placing it in the feed hoppers early each morning, a blind person will know that there is something wrong with his flock if any feed is left in the feeders from the day before. He can then call the county agricultural agent or someone else to immediately make an early diagnosis so that remedial action can be taken before the trouble reaches an advanced stage or gets completely out of control. A person with sight will often wait until he sees outward symptoms of trouble before taking action. Sometimes this is rather late."

A representative of a large feed concern, who is an authority on the raising of broilers, has this to say:

"By keeping daily records of feed consumption, you can notice a decline as soon as it appears. This is a definite sign that something is wrong. Correcting a problem in its development is much easier than suddenly to find out your flock is 'off feed' and a serious respiratory outbreak is affecting the growth and uniformity of your broilers."

2. Examples of Diseases Detectable by Touch, Sound, or Both

Touch.--Many ailments in turkeys are identified by touch. The birds droop, squat, are listless, or remain under foot, all of which are indications of some kind of approaching sickness, such as coccidiosis and hexamitiasis, blackhead, trichomoniasis, pullorum, infectious sinusitis, Newcastle, and erysipelas. (For symptoms see subsection on Diseases.)

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Sound. --All respiratory diseases are easily identified by sound. The birds gasp for breath, sneeze, wheeze, or have rattles in their throats, all of which are indications of approaching sickness, such as infectious sinusitis (air sac), Newcastle, pneumonia, and bronchitis. (For symptoms, see subsection on Diseases.)

Note: Infectious sinusitis and Newcastle may be detected by either sound or touch.

## H. Marketing

### 1. When to Market

According to information contained in "Farmers' Bulletin 1409," U. S. Department of Agriculture, experiments with standard-bred and Broad Breasted Bronze turkeys have shown that well-fed young birds of these varieties are marketed to best advantage at ages ranging from 26 to 30 weeks, the average being 28 weeks. Under the most favorable conditions, hen turkeys of these varieties may be ready for market as early as 24 weeks and the toms at 26 weeks. However, many are marketed at 24 to 26 weeks that are somewhat deficient in fat and possess numerous short pinfeathers. In general, if turkeys are kept longer than 30 weeks, the cost of further grains and the extra labor for their care cause the cost of production to rise rapidly.

Small type varieties usually are ready for market at 22 to 26 weeks of age; however, they may be marketed at 14 weeks as broilers. As with the larger varieties, conditions of rearing may affect the time required to produce market birds. Cool weather, during the later growth stages, tends to speed up growth and subsequent maturity in all types of turkeys.

### 2. Selecting Turkeys for Market

If rearing conditions have been satisfactory, the inspection of a few representative birds will serve to tell whether or not the flock as a whole is ready for market at the usual age. Under most conditions, it is important to market only turkeys which are fat and free from short, unpickable pinfeathers. To determine market quality, suspend the bird by the legs and examine the skin around the shoulders, over the breast, and on the drumsticks for presence of pinfeathers too short to be cleanly picked without leaving a deposit of feather pigment in the skin. If noticeable numbers of short pinfeathers are present, the bird will not pick clean.

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Defects due to injuries before and after the birds are killed are common and cause loss of grade. Great care should be taken not to allow the birds to bruise themselves by flying or running against obstructions or by piling up; therefore, smothering and trampling each other. The use of a catching chute or a small catching pen is recommended. A strong catching hook is useful.

#### 3. Shipping Live Turkeys

In shipping live turkeys, it is a good plan to consult the buyer and transportation company regarding details of crating and handling.

Careful handling of turkeys will do much to insure top prices. Birds with broken legs and wings, and with bruises due to rough handling, go into lower grades and sell at lower prices. Crowding too many birds into the market coop may result in some being smothered or trampled and scratched so badly that they are almost a total loss. Allow room for all of the birds to stand fairly comfortably in the coop.

Coop size is important. It should be deep enough to allow the birds to stand but no deeper. Shallow coops force the birds to rest on their breasts, which if bruised, result in a lower grade classification. A height of 18 inches is recommended for turkeys.

Since turkeys frighten easily and fly, thus bruising their flesh and frequently breaking bones, it is advisable to use a catching chute when catching and crating for market. The use of a catching chute prevents turkeys from piling, and enables the operator to catch them by the legs without being seen. One type of chute is 4' to 8' long, 24" to 30" wide, and 3' high. The top is solid and there is no bottom. There is a sliding gate in each end and a set of fencing wings for one end. One or both sides may possess a slatted or wire covered framework which is covered with burlap coming to within an inch of the ground. The slatted framework comes to within about 12" to 16" off the ground. Birds are driven into the chute by way of the wings and are removed easily by the legs under the burlap.

#### 4. Processing Turkeys for Market

Marketing dressed turkeys requires much more experience and special equipment than the average producer possesses or



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the size of his project warrants. Dressing turkeys for shipment is a rather hazardous business, and a careful study should be made before dressing is attempted. It would be advisable to arrange for some demonstrations before attempting to dress turkeys on a large scale. See the county agricultural agent for details.

In farm processing plants, turkeys are usually killed by one or two methods--cutting the bird's throat from the outside or from the inside. Cutting from the outside is the most popular method. Regardless of the method used, the large vein and the cross vein should both be cut.

In the standard method of slaughtering and picking, the bird is hung up by the feet with the head held in one hand by the operator. Barrels, funnels, and shackles hung from the ceiling, or line, rope, or cord hung from ceilings or pipes are used in killing and bleeding poultry. Killing by cutting the birds' throats from the outside and throwing them into barrels is the most efficient method from the standpoint of time and travel. However, from the standpoint of quality maintenance, carcasses of birds put into funnels or hung by shackles are superior, as the muscular spasms of birds thrown into barrels cause bruises.

Wet picking is the method most commonly used today. Birds are immersed in hot water ranging in temperature from 128 to as high as 190°F. Turkeys are often wet picked after being in water at a temperature of about 139°F, for a period of approximately 30 to 35 seconds for young birds, and from 40 to 50 seconds for adult birds. The time of immersion in a scalding tank depends upon the temperature of the water as well as the kind, class, and age of the birds. Experimental work on the part of the turkey grower is necessary to ascertain the scalding time and temperature required to prepare birds to suit consumer demands. Since it is necessary for the hot water to reach the skin of the birds, the water in the scalding tank should be agitated during the immersion, or the birds should be kept in continual motion while in the water. Scalding tank water should be kept clean. This is important as some of the scalding water may be absorbed internally by the birds or when the external skin is torn, dirty water may cause the flesh to become contaminated.

There are two methods of picking turkeys--machine and hand. Machine picking is much more rapid than by hand. However, mechanical pickers need frequent attention from the standpoint of cleanliness; otherwise, all the carcasses may become contaminated by the continued accumulation of filth.

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Picking by hand is the most common method; and a definite and desirable order for the removal of feathers is as follows:

1. Main tail feathers
2. Primaries and secondaries of the wings
3. Back
4. Legs
5. Area around vent
6. Contour feathers of the wings
7. Breast
8. Neck

A small handful of feathers should be pulled at a time, especially on the breast and thighs which are easily torn.

Pinfeathers can best be removed by use of a poultry pinning knife or other instrument such as a strawberry huller. When pinfeathers cannot be removed without digging into the skin, they should be allowed to remain because a skin injury is worse than a pinfeather.

After pinning, the birds are singed by rotating them while being passed over a flame, in order to remove the hairs. On farms, singeing is done by use of bottled gas, a blow torch, an alcohol burner, or a kerosene burner.

Feed is stripped from the crop by massaging the crop and neck and forcing the feed out of the mouth. This is preferable to making an incision as it lessens the danger of spoilage and gives the bird a better appearance. Vents are squeezed to force out the fecal matter which may still be in the lower intestines. This is accomplished by pressing on the abdomen just below the vent.

In the final washing, the carcass should be passed through a spray or sprays which provide an abundant supply of fresh clean water either under pressure or for scrubbing action.

Rapid chilling is essential in maintaining high quality of fresh-killed poultry. Chilling increases the length of time that birds may be held without off-flavors developing. There are two general methods of chilling used on farms--ice and water chilling and air chilling. Ice chilling is most often used.

In most farm processing plants, hogsheads, milk coolers, or large metal or hard-surfaced tanks are used for ice and

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water chilling. All containers and equipment should be thoroughly cleaned with hot water and soap at least once a day. Only ice produced from water, suitable for drinking, should be used in vats or tanks. A temperature under that of 40°F. should be maintained at all times during chilling. Chilling tank water must always be clean. Only perfect and thoroughly cleaned birds should be placed in chilling tanks.

The length of time carcasses should be allowed to remain in chilling tank is as follows: birds of less than 8 pounds, 6 hours; birds 8 pounds and over, 8 hours; or when the internal temperature has reached 36°F.

In air chilling (unless the birds are dry picked), after being passed through a spray of clean water, the birds should immediately be hung on racks, ropes, or shackles.

## 5. Marketing Procedures and Trends

The marketing season for the bulk of the turkey crop usually is comparatively short, extending from early November through late December. However, there is an increasing demand in the winter and late summer for fresh roasting turkeys and a year-round market seems likely to be developed soon. Many turkey raisers sell their birds alive to poultry dealers who either dress or ship them alive to city markets. In sections where turkeys are grown in large numbers, dressing plants have been built by cooperative associations or by poultry processors who collect the birds and dress them for market.

Farmers near city markets often dress their turkeys and sell them direct either to the consumer or to city dealers. In territories adjacent to large cities, marketing of both live and dressed birds at roadside markets has become common. Some growers have developed profitable gift-package businesses, delivering by truck, express, or parcel post. The dressed turkeys are shipped in sealed packages containing dry ice--about 1 ounce of ice per pound of turkey.

In certain localities, turkey growers may take advantage of the unique method of marketing turkeys by conducting a "Turkey Shoot." A true example is that of a small grower who began with 150 poults. When marketing time came, the owner, who was quite a sportsman, decided to hold a "Turkey Shoot." He furnished the shells and charged \$1 for each shot. The number of chances or shots was determined by the number of pounds of live weight per turkey; thus an 18-pound turkey at \$1 per shot would net \$18 minus the cost of the 18 shells.



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This method of marketing proved so satisfactory and successful, that over a period of 6 years he built his turkey business up to 750 or 800 turkeys per year, each of which was marketed through shooting matches held from the first of November through the end of December. This brought a tremendous profit in comparison to the normal or conventional methods of marketing poultry.

New marketing developments which have helped to popularize turkey meat and definitely appeal to homemakers are: eviscerated turkeys (whole) ready for the oven and sometimes stuffed with dressing; turkeys cut into halves, quarters, steaks, or smaller pieces; and the availability of the small-type turkey.

#### I. Record Keeping

The many details which are of vital importance to the success of poultrymen make some form of record keeping a necessity. A good system of records keeps the business on a sound basis; reflects the economic possibilities of poultry; develops business leaders; provides poultry raisers with helpful and timely information; and assists in establishing a favorable credit rating. Daily records should be kept of feed consumption, expenditures, and income.

Turkeys should be given all the feed they will clean up. The kind and amount they eat will increase with their age, and any decrease in feed consumption is an indication of some form of approaching trouble. For this reason it is necessary to carefully weigh, and keep a daily record of all feed consumed by turkeys of different sizes and ages. Record-keeping-cards for this purpose can be obtained from all feed stores; poultry growers associations; and the State Departments of Agriculture.

Successful turkey growers keep a detailed accounting of all expenditures and income as follows: Cost of poults; cost of buildings and materials for constructing rearing pens and other facilities; brooders; waterers; feeders; tools; feed (starting mash, growing mash, growing pellets, fattening pellets, grain, oyster shells, and grit); medicine; disinfectants; insecticides; veterinarian services; insurance; interest; electricity; water; depreciation of buildings (5% per annum); brooders and other equipment (10% per annum); loss of poults from death or other causes; transportation; and when the project is not a full-time operation, man-hours of labor.

Income from all available sources should be carefully recorded. It may include returns from the sale of live or dressed

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turkeys; turkeys eaten by the family (credited at prevailing market prices); and by-products, such as the sale of fertilizers and feathers.

Account books especially compiled for the use of keeping records of expenditures and income of farm projects may be obtained from State Departments of Agriculture.

J. Training

Training in the proper use of scientific methods of poultry management and modern equipment is of the utmost importance to poultrymen, whether blind or sighted.

Information obtained from bulletins published by the U. S. Department of Agriculture, State departments of agriculture, and associations interested in research and improvement of the poultry industry, proves that most successful growers are trained persons who avail themselves of every opportunity to improve their methods and increase their knowledge of the poultry business.

Irrespective of sight and training, everyone is not suited, either by temperament or physical make-up, to be a poultryman. Therefore, it is important that blind persons, before planning a training program for the raising of turkeys, make certain they possess the abilities and qualifications essential to their happiness and success. They should be well adjusted to their blindness; able to qualify for the job of raising turkeys in confinement (as described under "Job Specifications," page 44); possess at least average ability to do simple construction work and make minor repairs on buildings and equipment. They must like the kind of poultry they are to raise; have no aversion to working with sick poultry or performing the somewhat distasteful tasks of cleaning and sterilizing dirty, foul smelling poultry houses; be able to take reverses without becoming unduly discouraged; like to work alone; have no objection to being tied closely to their work and kept at home; be willing to work long hours; like to attend to details; be punctual and perform their duties regularly; and be willing to meet emergencies as they arise, day or night.

After careful consideration has been given to the many factors affecting the lives of individuals, and it seems reasonable to assume they will be successful in raising turkeys, a comprehensive program of training which will meet the needs and desires of the individual should be developed. The training plan should be written out in detail. Where training supplies, materials, or equipment is required, the trainer, all materials, equipment,

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and supplies should be approved by the County Agricultural Agent, the State Commissioner of Agriculture, or some other recognized authority.

The kinds and amount of training required to fit blind persons for raising turkeys in confinement will vary in individual cases. It will depend upon such things as their background of experience, education, skills, knowledge of poultry and poultry work, the methods they plan to use in marketing, and whether they will be working entirely alone or occasionally have the assistance of a sighted person.

Turkey growers, especially operators of small and medium-size projects, must possess a wide variety of skills (in addition to their knowledge of turkeys), for their responsibilities are those of manager, planner, supervisor, laborer, and businessman.

Operators of large projects seldom take part in the daily work of caring for turkeys and constructing and repairing equipment. Therefore, the variety of skills they possess need not be so diversified, since they must employ several workers, each of whom must have the ability to perform the different tasks that are essential to the success of the project.

Before undertaking to raise turkeys, it is strongly recommended that blind persons who have not acquired the necessary knowledge and skills through experience or working with others engaged in the business, should take a course of training in the care of poultry, poultry management, and farm shop work.

Some of the training programs now in operation are described in the following paragraphs:

1. In a few States, the agency providing vocational rehabilitation services for the blind and the College of Agriculture work together in organizing and conducting farm training programs for the blind.

In some instances, persons are enrolled as special students and receive instruction through lecture courses, class discussion, and supervision in the physical performance of the details of the daily work as it is conducted on the college farm.

In other instances, specialists from the various farm divisions of the college serve as consultants and advisers to the vocational rehabilitation counselors working with farm clients. The counselors then confer with the county



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agricultural agent and select an experienced and successful farmer who observes, supervises, and assists the trainee in the operation of his project which has been set up on his own farm. The farmer who acts as supervisor makes regular reports on the progress of the trainee to the rehabilitation counselor and the county agricultural agent.

2. A private agency, the Cincinnati Association for the Blind, operates a farm school for the blind at Mason, Ohio. Courses are offered in the care of poultry and poultry management, dairying, bee keeping, hog raising, farm maintenance, and farm shop work. As the demand arises, other courses are added to meet the needs and desires of individual trainees.

Trainees attend lectures given by specialists from the various divisions of the agricultural college, and take part in the daily work under the immediate supervision of their instructors and the superintendent of the farm. In addition, trainees are given instruction in orientation to a farm situation and afforded an opportunity to participate in outside activities which are of interest to farmers (Grange meetings, and special classes conducted under the direction of the home demonstration agent and county agricultural agent, or instructors of vocational agriculture). Upon completing training at the farm school, some State vocational rehabilitation agencies assist the trainee in setting up a project on his own farm under the immediate supervision of the county agricultural agent. A reputable farmer supervises and advises the trainee on the best methods of operation. The farmer and the agent also make regular reports on the trainee's progress to the Vocational Rehabilitation Counselor.

3. One State agency, Missouri, has a farm training program which it operates on a 143-acre farm under the direction of the owner, who is a graduate in agriculture, a successful farmer, and has about 5/200 vision. Programs are set up to meet the needs and desires of the individual trainees; and in most instances, extend over a 9-month period.

Before completing the course, each trainee takes over the entire management of the farm for one month, and outlines the plan he intends to follow on his own farm.

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The rural specialist makes frequent checks on the trainee's progress and assists in setting him up on his own farm, where he completes his training under the supervision of the county agricultural agent.

4. Most State agencies have no regular plan for training clients to become farmers or farm workers. Individual training plans are made by the rehabilitation counselor as the demand arises; and such trainers as feed dealers, individual farmers, and county agricultural agents are employed to observe, advise, and supervise the projects. Trainees, under this plan, acquire their knowledge from supervised work experience and reading of textbooks and bulletins published by authorities on the particular farm activities in which they are interested. In some instances, on-the-job training as a farm worker is considered most practical.

When training, as described in this section, is given a client, it is of the utmost importance that regular reports of the trainee's progress be made to the vocational rehabilitation counselor, in order that he may evaluate the training and provide additional assistance as may be necessary.

K. Cost of a Training Project

No attempt will be made to estimate the cost of purchasing land or erecting buildings. These factors fluctuate and differ greatly in the various parts of the country and will be governed by local conditions and personal situations. Many persons own or have access to a small piece of land in the suburbs, a small acreage in the country, or an unused portion of a general farm which could easily be equipped to keep turkeys. Frequently, the property has unused buildings on it, such as a garage, poultry house, or shed that can be converted into sanitary and convenient quarters for turkeys; and a person who is handy with tools can often do the necessary work with little or no financial outlay. Often there is sufficient quantity of scrap lumber about the place to build rearing pens. The utilization of these materials cuts the financial outlay for equipment decidedly and requires mainly initiative and skill on the part of the operator. When it is necessary to purchase lumber, nails, and a few incidental items, the cost will be very little.

Since it is impossible to know all the conditions and circumstances affecting the starting of a project, the example, given below, is based on three conditions; namely,

Raising Turkeys in Confinement (Contd.)

1. That the client have adequate space and housing for raising 300 turkeys; that the building in which they are housed needs only minor repairs; that there is sufficient scrap lumber, poles, and materials about the place to construct rearing pens and roosts; and that the client has the skill and ability to make the necessary improvements himself;
2. That the client purchase 300 one-day-old poults--the first lot of 150 to be the small type turkey, started the first of February, and marketed the last of May (about 14 weeks) as broilers; and the second lot of 150 to be the large type, started the last of May, and marketed the last of November (about 24 weeks) as roasters; and
3. That all feed consumed be purchased.

Example: Any space containing approximately 200 square feet which can be kept warm; free from rodents; dry; well ventilated; free from drafts; and provides some sunlight, will accommodate 150 poults during the brooding period of 8 weeks. Additional space, separate from the brooder house and rodent proof, should be available for storing feed.

According to information obtained from county agricultural agents in different parts of the country, lamp-heated brooders are inexpensive, efficient, and adequate. A heating device that will take care of 150 poults is estimated to cost approximately \$10 (exclusive of labor), including minor electrical installations and heating bulbs.

Feeders and waterers can be made for brooder houses, or purchased for a very small sum, approximately \$10. Sanitary feeders and waterers to accommodate 150 growing turkeys can also be built at a good saving, or purchased for about \$25.

According to information obtained from county agricultural agents and hatcheries, day-old turkeys, small type, from strains having disease free records, can be purchased for 55¢ each, and large type for 75¢ each, or \$195 for 300 poults. Prices will fluctuate from year to year based on supply and demand.

Reliable data shows that both small and large-type turkeys raised in confinement to market age of 24 weeks require 4 to 6 pounds of feed to produce one pound of meat; that 3 pounds are required to produce one pound of the small type turkey to market age of 14 weeks; that the average cost of feed (mash and grain) in 1953 was \$5.50 per hundred weight; that the cost of electric heat and medicine is approximately 1¢ per pound of



Raising Turkeys in Confinement (Contd.)

turkey meat; and that the successful growers raise approximately 90 percent of their turkeys to market age. Using these figures as a basis and taking 4.4 pounds as the amount of feed required to produce one pound of the large type turkey to a market age of 14 weeks, it would cost 25.2¢ to produce one pound of large type turkey meat, and 18¢ to produce one pound of the small type turkey.

Consider that one-half of the flock (135, after deducting 10 percent mortality) averaging 8 pounds each is sold for broilers at 14 weeks of age, the cost of feed, heat, medicine, and poults (150 at 55¢ each) would be \$271.50; and feed, heat, medicine, and poults (150 at 75¢ each) for large type turkeys averaging 17 pounds each at 24 weeks, would be \$698.40.

The items of cost for establishing a training program as described in the above example are as follows: Feeders and waterers for brooders, \$10; heat lamps and wiring, \$10; materials for building feeders and waterers for growing turkeys, \$25; 150 poults at 55¢, and 150 poults at 75¢ each, \$195; feed, heat, and medicine for small type poults raised to market age, \$189; feed, heat, and medicine for large type poults raised to market age, \$585.90. Total cost of project, \$1,014.90.

The returns from the sale of 135 8-pound small type turkeys (1,080 pounds) at the 1953 live weight market price of 41¢ per pound, is \$442.80, less the cost of \$271.50, or net return, \$171.30.

The returns from the sale of 135 17-pound large type turkeys (2,295 pounds) at the 1953 live weight market price of 34¢ per pound, is \$780.30, less the cost of \$698.40, or net return, \$81.90.

The net return from the sale of both small and large type turkeys (\$253.20), less the cost of equipment purchased for the project (\$45.00), would be \$208.20.

In training projects conducted in areas of the country where the operator can raise grains and green feed, the cost will be cut materially from that given in the example.

### III. REMARKS

The above information was obtained from a personal observation, analysis, and performance of the operations involved in the raising of turkeys at the farm of Steve Alsaesar, a totally blind man, Cincinnati, Ohio; the text "Turkey Management" by Marsden and Martin; "Starting Right with Turkeys" by G. T. Klein; Farmers' Bulletin No. 1409 titled

Raising Turkeys in Confinement (Contd.)

"Turkey Raising", and Farmers' Bulletin No. 1652, "Diseases and Parasites of Poultry" published by the U. S. Department of Agriculture, Washington, D. C.; and two county agricultural agents who have observed and worked with successful poultry raisers who are blind.

Authorities agree on all of the important phases of the industry, and persons contemplating the raising of turkeys should avail themselves of the information derived through research and the experience acquired by persons engaged in the business.

Irrespective of sight, growers should, at the first sign of disease in the flock, consult the county agricultural agent for advice, obtain the services of a veterinarian to diagnose disease and administer treatment. (See pages 20 to 28 on Diseases, Pests and Common Ailment); take advantage of current information developed on scientific methods of feeding, care, and management; and attend schools conducted by the National Turkey Improvement Plan for training growers in methods of selecting turkeys for marketing and grading dressed turkeys.

All of the operations involved in the raising of turkeys have been observed, analyzed, and performed by a totally blind staff member in Services for the Blind; and it has been determined that sight is not necessary for successful performance of the daily tasks or management of the business. An unusually high percentage of the tasks involved are performed by a blind person in the same manner as by a sighted person. Blind persons possessing the skills to successfully care for turkeys will usually have imagination and ingenuity sufficient to solve problems as they arise, such as purchasing a Braille thermometer for controlling temperature.

The raising of turkeys provides four distinct possibilities; namely, an opportunity for:

1. Families of small means and with limited space who, by raising their own meat, will reduce their living costs;
2. Operators of general farms or projects of a mixed nature who want to increase their number of activities to supplement their sources of income;
3. Growers wishing to engage in a project for the exclusive purpose of marketing live and dressed turkeys to the wholesale and retail trade; and
4. Persons desiring to establish a business selling dressed turkeys, with or without stuffing; in halves; or cut-up and sold by the piece direct to the consumer.

Raising Turkeys in Confinement (Contd.)

Before deciding to engage in a project of a commercial nature, blind persons should make certain that:

1. There is a dependable market;
2. They have selected a variety which is best suited for the type of customers to be served;
3. There is a reliable source from which to purchase hatching eggs and poults having a disease-free record;
4. They possess a working knowledge of the business acquired through experience or training;
5. They are familiar with the services of the National Turkey Improvement Plan; Turkey Growers Association; the State and Federal Experiment Farms; and the U. S. Department of Agriculture;
6. They are familiar with the services provided farmers by the various County, State, and Federal agencies; and
7. That arrangements are made for sighted help to advise and assist with the activities which require sight.

## IV. JOB SPECIFICATIONS

Tasks Performed

The operator obtains the various types of feed, including the concentrates and succulents, from source of supply, and stores it in feed room or building adjacent to the turkey house. He measures and weighs the feed and places it in the feeder. He sterilizes and fills the water containers. The brooders, rearing pens, and equipment are kept clean, sanitary, and in good repair. He keeps simple records of his expenses and income. He must constantly watch for the first sign of disease. He sells his stock by contacting his customers by letter, phone, or in person.

## V. REQUIREMENTS

Physical: Active age; standing and walking most of the time. Bending is required to care for turkeys and repair buildings and equipment.

Feet: Ability to walk, stand, and stoop.

Hands: The use of both hands.



Raising Turkeys in Confinement (Contd.)

Thumbs: The use of one or both.

Fingers: Index, middle, and ring finger on one hand or both.

Vision: No vision required in the daily process of work.

Hearing: When the worker is blind, good hearing is required.

Mental: Alertness, good memory, coordination, and ordinary pace.

Educational: Understanding of the English language; ability to read and write is important, but this service could be supplied by a member of the family or a reader may be hired.

Physical Environment: Usually in small or medium-sized buildings (turkey house and rearing sheds); noisy; works alone or with sighted help, as required.

SPECIALTY FARM  
RAISING TURKEYS

CHAPTER II - RAISING TURKEYS ON THE RANGE

II. OPERATIONS INVOLVED AND FACTORS TO BE CONSIDERED

The following information was secured from a personal interview with Mr. VaNon Dahle, a totally blind man and his sighted wife, who raise turkeys on the range near Clarkston, Utah; from a comprehensive study of bulletins, books, and journals published by the U. S. Bureau of Animal Industry; books written by authorities on the subject; and from consultations with two county agricultural agents.

Many of the operations involved in the daily work of raising turkeys on the range require full use of sight. However, it does not follow that a blind or visually impaired person, with sighted assistance, cannot be successful in raising turkeys by this method.

Mr. VaNon Dahle, a totally blind man, who raises turkeys on the range, has demonstrated that about 75 percent of the work can be performed successfully without sight.

A. Advantages and Disadvantages of the System

Some of the advantages of raising turkeys on the range are:

1. Lower cost for feed and equipment;
2. Less trouble from breast blisters, feather picking, cannibalism, and foot and hock deformities;
3. Less difficulty in supplying an adequate diet.

Some of the disadvantages are:

1. A large area of land is needed for range and the turkeys are not under the direct control of the operator. These conditions make it mandatory that operators, who are blind and those with serious visual impairments, have the assistance of sighted persons.
2. The large area of land needed for range makes it more difficult for persons, with a small amount of land and little capital, to get a start;

Raising Turkeys on the Range (Contd.)

3. There is more danger of losses from predatory animals, thieves, parasites, and soil borne diseases such as blackhead;
4. It is more difficult to provide adequate shelter from extreme heat, cold, and inclement weather.

B. Points Necessary for Success in Raising Turkeys

1. Try to locate near a good market. This may be near a small town or city, and should always be accessible to buyers of live turkeys;
2. Since turkey production requires a high investment per bird, make careful inquiries as to the different types and sources of loans available for financing the production phases and marketing operations;
3. Before building any production or marketing facilities, make a decision as to whether turkeys will be sold alive only, or whether investment in processing equipment would be wise;
4. Determine the kinds and classes of turkeys wanted by buyers of both live and processed turkeys;
5. If processing is to be done, try to locate on a busy highway;
6. Processing facilities are expensive. Be sure to take into account the additional investment necessary to maintain this kind of marketing;
7. If the annual volume is as large as 2,000 birds, consider the use of a picking machine;
8. Become acquainted with existing Federal, State, and municipal regulations which pertain to processing, transporting, selling, and other applicable operations;
9. Discuss all plans in detail with the county agricultural agent and turkey marketing specialists in the State College of Agriculture. Avail yourself of the benefit of their experience.

C. Locality

In general, it may be said that turkeys are grown successfully in practically every part of the country, as they stand both heat and cold and high and low altitudes, provided they are given adequate seasonal shelter from winter weather, dampness, and summer heat.



Raising Turkeys on the Range (Contd.)

Turkey projects are being conducted in small towns, in the vicinity of large cities, in remote rural areas; on general farms and on large farms where flocks of from 5,000 to 60,000 are grown.

The important areas of production now are the Middlewest, the Pacific Coast, and the Middle Atlantic States, where turkeys are raised for the most part on the open range.

D. Housing

There are many different styles and types of housing that turkey growers have found to be convenient and adequate for their use. Anyone contemplating going into the business should consult the county agricultural agent for advice regarding appropriate housing for that particular area. He should also write the poultry division of the Agricultural College in his State, and the Bureau of Animal Industry, U. S. Department of Agriculture, Beltsville, Maryland, for information and drawings to use as a guide in planning the purchase or construction of housing.

Frequently, there is unused space in a barn, garage, or other outbuilding that may be remodeled for storing feed or brooding poults; therefore, eliminating the cost of erecting new and expensive quarters. Regardless of the building utilized or the space occupied, the feed supply, brooders, and rearing pens should be arranged in such a manner as to eliminate unnecessary travel and retracing of steps in the process of the daily work.

Feed should be stored where it is dry and protected from contamination by rats and other rodents, because molded feed causes many illnesses in turkeys and all rodents are carriers of disease. The storage space required will depend upon the availability of the feed and frequency of delivery. A small storage space of approximately 100 square feet is a convenient size for most projects.

1. Brooder Houses

The following information was taken from "Turkey Management" by S. J. Marsden and J. H. Martin.

Elaborate housing is not required anywhere in the United States for successful turkey management. During the brooding period when birds are raised artificially, all that is needed is a brooder house that can be heated to a floor temperature of about 70° F.

Raising Turkeys on the Range (Contd.)

In warm climates the construction may be cheaper than in cold climates. Turkeys brooded in advance of the normal season may require better housing than those brooded in the normal spring season. The general principles of brooder house construction for all kinds of poultry may be applied to turkey brooder houses. A warm dry floor, ample light, sufficient ventilation, protection from vermin, tight walls, and a roof that will retain the heat and protect against the weather, are the requirements. Interior fixtures required are: Brooder, roosts, water fountains, feeders, wire-covered platforms for feeders and waterers, and litter or wire floors.

Portable brooder houses are constructed of wood or composition board and placed on skids. If use in subfreezing temperature is contemplated, the floors should be double-boarded with building or tar paper between the layers. The walls are usually single-boarded with tight-fitting material. The roof is commonly made of boards and composition roofing, or less frequently, of metal or plywood. A house 10' by 12' or 9' by 14' is satisfactory in size. Brooder houses much larger cannot be moved readily and houses much smaller are not economical. These sizes will carry about 180 poults for the first 8 weeks.

## 2. Housing During the Rearing Period

Practically all turkeys raised in the United States are without overhead shelter after the age of 8 to 12 weeks. The roosts are merely set up in the open. Protection is afforded by watch dogs, guards, fences, lights; and shade is provided by natural or other means. However, the use of range houses is increasing and prefabricated range shelters are now on the market.

The features desired in a range shelter are: a reasonably tight roof that will shed most of the rainfall; protection from prevailing winds that bring cold, snow, or rain; protection from all predators; properly constructed roosts; sanitary conditions; and good ventilation.

These advantages may be provided by a simple shelter constructed of wood, wire, and roofing. The type of construction which will best meet the needs of growers will depend upon the method used in ranging turkeys.

Raising Turkeys on the Range (Contd.)

There are two types of range rearing: (a) limited range or semi-confinement, and (b) open range.

a. Limited Range

This type involves the use of fully or partially fenced areas large enough to provide growing feed. An outstanding example is the so-called "Minnesota Plan" which is now widely used all over the country. This plan consists of moving the birds and rearing equipment once each week to an adjoining clean area of a large field. Range shelters built on skids with roosts under the roof are desirable in most situations. They furnish roosts, shade, and protection from weather. Shelters 10' by 12' to 10' by 14' furnish roosts, shade, and protection from weather for 100 to 130 turkeys each.

Some suggestions to be considered in the building of range shelters are:

(1) Roofs

Galvanized roofing makes a satisfactory and economical roof in almost any climate. If the sheathing is tightly boarded underneath to prevent wind damage, roofing paper makes a good type of cover for shelters. In localities where lumber is available at reasonable cost, over-lapping boards make a fairly good roof. Where growers have access to such things as brush, marsh hay, straw, or corn stalks, they may be used to make inexpensive but satisfactory roofs.

(2) Walls

Woven wire, studding, and a few boards usually make up the walls. Studding may be of 2" x 2" material in low-eaved portable buildings; 2 x 4's or poles are used in buildings with high eaves. Wire for side walls should be as follows: Where walls are 3' in height, the wire should be strong, of 1-1/2" hexagonal mesh, 16-gauge, or 1" hexagonal mesh, 18-gauge, tightly fastened to exclude dogs; where not within reach of dogs, less expensive wire of 1-1/2" or 2" mesh, 18-gauge, may be used.



Raising Turkeys on the Range (Contd.)

## (3) Floors

Range-house floors must be strong, durable, and sanitary. The top of the floor should be at least 16" above the ground or other surfaces which receive droppings that fall through the floor. Wire netting, sufficiently strong to keep birds from crawling beneath the floor and eating the droppings, should be used to enclose the entire outer surface of the range shelter from the floor to the ground. The following floor materials are satisfactory: 1" to 2-1/2" wide wooden slats painted with creosote or crankcase drainings and placed flatwise 1" to 1-1/2" apart, or on edge 1" apart; 1-1/2" mesh, 16-gauge, hex-weave wire; 1" x 2" or 1" x 4", 11- to 12-1/2-gauge electric weld wire; 1-inch 12- or 14-gauge hardware cloth, or welded wire floor sections. The 3 types of wire are nailed to removable wooden frames of 2" x 4" material on the outside, and 1" x 4" pieces on the inside. The top of each 2" x 4" should be beveled to prevent an upper surface of only about 3/4". The wire is only nailed to the 2" x 4" framework, not to the 1" x 4" center supports. A strong 1" or 1-1/2" staple or 8-penny nail is used to fasten the wire.

## (4) Roosts

Poles 2" to 4" thick or half round 2 x 4's make the best roosts. For Broad Breasted Bronze they should be set level, but for other types of turkeys they should be tilted at a 15- to 20° angle. In general, the high side of the roost should be placed toward the prevailing wind. In most cases, step ladder roosts are better than roosts all placed on the same level, because the birds can go to roost in a more orderly manner. Roosts should be placed 20- to 24" apart on center (center to center); for large-type turkeys 24" are preferred. The last roost should be placed 18" to 2-1/2' from the ground or floor. Low roosts built in the open, all on the same level, about 8- to 14" from the ground, are becoming popular. There is no advantage in high roosts. Allowing no roosts at all beyond the brooding stage is considered best for the Broad Breasted Bronze.

Raising Turkeys on the Range (Contd.)

## b. Open Range

Several methods of open range rearing are in use. Herding consists of keeping the birds in the flocks under control during the daylight hours and seeing that they assemble and roost together in a group at night. This is usually accomplished by a herder on horseback or on foot, and dogs that have been trained to assist without injuring the birds. Camping facilities such as a wagon, automobile trailer, or a tent that can be moved readily from place to place are usually provided for the turkey herder. Lights, particularly road flares, gasoline torches, and kerosene lanterns are often set up at night to keep off coyotes and other predatory animals. Portable roosts, feeders, and watering devices are usually used.

In the small-unit range plan, the poults are reared in groups of 200 to 500, scattered well apart over a large range area. The birds within a group are of the same age. A simple shelter is used, sufficient in size to protect the poults from the time they are put on range until they are about  $3\frac{1}{2}$  months old. Roosts are then set up near the shelter, and a portable corral of ordinary heavy weight poultry fencing is set up around the shelter, roosts, and feeders at night to give protection from predators. Additional protection afforded by dependable watch dogs, or a night guard, is almost always necessary. Ad libitum feeding is practiced under this plan. If the poults are not full-fed, the various flocks will intermingle unless they are placed long distances apart. With full-feeding, the units may be placed as close together as 500 yards, the distance depending upon the terrain and the nature of the vegetation. Each unit usually remains in the same place for the season, but may be moved if disease or range conditions warrant. If properly carried out, either plan provides excellent growing conditions.

Another method of open range rearing, consists in the use of islands and peninsulas to provide natural boundaries and a bountiful supply of water, unless it is salt water. However, as noted elsewhere, trouble with parasites is frequently encountered when turkeys have access to natural supplies of water such as lakes or streams. On account of this, the use of water as a means of confinement and for the turkeys to drink is not recommended.

Raising Turkeys on the Range (Contd.)

## 3. Fencing

Rectangular-mesh poultry fencing 5 feet high is generally used for confining growing turkeys. Regulation 58-inch poultry and rabbit fence is quite satisfactory. Six foot wire is recommended for yards that are small or narrow, such as brooder house yards, and for yards located on hill-sides. In long narrow yards, birds have a tendency to fly lengthwise of them and then over the fence. On hilly terrain the birds will fly down hill especially on windy days when they utilize the force of the wind to "take off."

On rigid-top gates and on buildings that are about 9 feet in height, antilflies must be placed to prevent birds from alighting on them and getting out of their yards. Antilflies are made of junior weight rectangular mesh poultry wire supported by 2" x 2" boards or by sections of light weight angle iron nailed or wired to the buildings, gates, or fences.

Fencing with top and bottom wires, 11- to 12 $\frac{1}{2}$ -gauge, and center wires, 14 $\frac{1}{2}$ - to 15 $\frac{1}{2}$ -gauge, is advisable. Stays should be 4 to 6 inches apart. In damp climate the best available rust-proofing is economical.

Steel posts are in common usage except where wooden posts are very cheap. For use in climates of high humidity, steel posts should be galvanized. Five-foot fencing requires 7-foot line posts and 8-foot gate and corner posts, while 6-foot fencing requires 8- and 9-foot posts, respectively. The line posts may be set a rod apart under ordinary conditions. In very loose soil or where conditions make especially heavy demands on the fencing, the spacing is best reduced to 10 or 12 feet. Special conditions may also necessitate setting the line posts 2 $\frac{1}{2}$ - to 3-feet in the ground instead of 2 feet. In ordinary firm soil and for the comparatively short stretches usually involved in poultry fencing, dirt-set corner and end posts are satisfactory. They are much cheaper to install and can be moved when necessary. Cement-set posts are required in soft earth and are preferable where long stretches of fence are required.

Fencing for permanent brooder house yards should be provided with baseboards close to the building and these should be placed close to the ground at all points. For older birds, it is necessary only to place the fence on the surface. Tight stretching is very desirable, however, in all cases.



Raising Turkeys on the Range (Contd.)

Gates should, in general, be the same height as the fences. In locations where they must be opened and closed frequently, a strong, rigid gate, preferably one with steel frame, is required. Electric fences are not suitable for confining turkeys, as they do not restrain the birds satisfactorily and tend to cause burns.

#### 4. Minimum Requirements for Range Equipment

The method of operation used by turkey growers will determine the type of equipment needed. However, the minimum essentials for all projects will include:

##### a. Roosts

Poles 2" x 4" thick or half round 2 x 4's placed 24" apart make the best roosts. Low roosts built in the open and on the same level, about 8- to 14" from the ground, are becoming popular. Allowing no roosts at all beyond the brooding stage is considered best for the Broad Breasted Bronze. Following is an example of a convenient and inexpensive, portable roost: The running gears of low-wheeled wagons are used and several wagons may be trailed at one time. A frame constructed of 4" x 4" material is built lengthwise of each wagon and fits on the front and back bolsters. Cross members, poles, or half round 2 x 4's, extending a few feet beyond the edge of the frame on each side, are placed at tight angles, and at 24" intervals over the entire length of the frame. Two by four posts extend from the four corners of the frame to the ground to prevent the roosts from tipping from the weight of the turkeys. These posts are removable or they may be hinged, so that they can be folded up out of the way when moving. Additional roosts may be added by leaning 4" x 4" supports from the side rails of the frame to the ground, and placing poles or half round 2 x 4's, 24" apart, at right angles to them. Such roosts are easily lifted and slid onto the wagon for quick and easy moving.

##### b. Feeders

When feeding is done under shelter, trough feeders are suitable. No cover is necessary, but a guard to prevent contamination should be installed. Trough type feeders are usually satisfactory for outside feeding. However, in climates having heavy rainfalls, shelters should be provided to prevent serious wetting of the feed. Large hopper type feeders built on skids require less labor in

Raising Turkeys on the Range (Contd.)

distributing feed and are coming into wide usage. There should be a minimum of one 10' feeder or 20 lineal feet of feeding space for each 100 birds. This type of feeder is not difficult to construct and anyone having a reasonable amount of mechanical skill will be able to build most of his feeding equipment and save considerable expense.

c. Waterers

A tank wagon is a common method of hauling to range. Troughs are frequently built on skids and may be made of metal or wood. There should be a minimum of one 10-foot trough waterer, or its equivalent, for each 250 birds. Regardless of the size, shape, or style of trough used, there must be some protection to prevent the water from becoming contaminated. An effective method is to fasten a reel directly above the trough. This will prevent turkeys from attempting to cross over to the other side of the trough. Another method is to have a trough completely covered. Slots in the side and near the top permit the turkeys to drink, and a float fastened to the valve in the storage tank keeps the water level adequate to supply the turkeys at all times.

E. Selecting a Variety

There are two classifications of turkeys, the Standard, which is a large bird, and the Non-Standard, which is considerably smaller. The variety should be chosen on personal preference, market trends, and general adaptability to each situation; and the strain possessing the characteristics best suited to the purpose, for which the turkeys will be used, should be selected.

Six standard varieties, popularly called breeds, of domesticated turkeys are recognized by the American Poultry Association, an organization having as its primary function the standardizing of varieties of poultry in North America. The Association publishes the Standard of Perfection, which contains descriptions of breeds and types of poultry.

1. Standard Varieties

The Bronze.—The Bronze is the heaviest standard variety; toms weighing approximately 22 pounds, and hens 13 pounds at market age of 28 weeks. Its skin is creamy white, or yellowish white if pigment-producing feeds, such as yellow corn, are eaten in large quantities.

### Raising Turkeys on the Range (Contd.)

The White Holland.—The White Holland is medium in size; toms weighing approximately 20 pounds, and hens 12 pounds at market age of 28 weeks. It originated from the Bronze or the wild turkey; its skin is white or yellowish white.

The Bourbon Red.—The Bourbon Red is medium in size; toms weighing approximately 20 pounds, and hens 12 pounds at market age of 28 weeks; its skin is white or yellowish white.

The Narragansett.—The Narragansett is a medium-sized variety; toms weighing approximately 20 pounds, and hens 12 pounds at market age of 28 weeks. The skin is white or yellowish white as in the other varieties. Young Narragansett poults resemble Bronze poults and cannot be distinguished from them.

The Black.—The Black is a medium-sized variety; toms weighing approximately 20 pounds, and hens 12 pounds at market age of 28 weeks. It is known in England as the Norfolk turkey. The skin is white or yellowish white.

## 2. Non-Standard Varieties

The great majority of turkeys now raised in the United States are the non-standard varieties, the Broad Breasted Bronze and the Beltsville Small White being outstanding examples.

The Jersey Buff.—The Jersey Buff is medium small in size; toms weighing 13 to 18 pounds, and hens  $8\frac{1}{2}$  to 11 pounds at market age of 24 to 26 weeks. It was developed through pedigree breeding and selection from crosses of Black, Bourbon Red, and Broad Breasted Bronze at the New Jersey Experiment Station, Millville, New Jersey; and is about 10 percent heavier than the Beltsville White at all ages. The light-colored pinfeathers are inconspicuous in the dressed bird.

The Beltsville Small White.—The Beltsville White is a small turkey; toms weighing 12 to 17 pounds, and hens  $7\frac{1}{2}$  to 10 pounds at market age of 24 to 26 weeks; also about  $1\frac{1}{5}$  to  $1\frac{1}{4}$  more turkeys may be raised with the same equipment and labor. This variety was developed by poultry scientists at the experiment farms of the United States Department of Agriculture, Beltsville, Maryland. It is identical in color with the White Holland but is smaller and is fast becoming popular with the buying public. It has a compact body, long keel bone, and abundant meat on breast and legs, and is suitable for small families and small owners. Its white feathering is a further asset since white pinfeathers, when present, detract less than dark ones from the appearance of dressed birds.



Raising Turkeys on the Range (Contd.)

The Charlevoix.—The Charlevoix is a small type Bronze about the size of the Jersey Buff; toms weighing 13 to 18 pounds, and hens  $8\frac{1}{2}$  to 11 pounds at market age of 24 to 26 weeks. It originated in Canada and is raised in limited numbers in that country.

The Royal Palm.—The Royal Palm is a new variety about the size of the Jersey Buff; toms weighing 13 to 18 pounds, and hens  $8\frac{1}{2}$  to 11 pounds at market age of 24 to 26 weeks.

The Broad Breasted Bronze.—The Broad Breasted Bronze, although a non-standard variety, is a large turkey; toms weighing 22 to 24 pounds; hens 14 to 15 pounds at market age of 24 to 26 weeks. It is most extensively used of all varieties; is distinctive for its body type; and yields about 6 pounds more of all lean meat per hundred pounds than other turkeys.

Of all these varieties the Broad Breasted Bronze, standard-bred Bronze, and crosses between them are by far the most popular, probably together comprising 90 percent of the turkeys in the United States.

All sizes and varieties of turkeys can be raised successfully and profitably on the range. However, the smaller varieties are winning favor with many growers; a larger number can be raised in a given space; they can be marketed as broilers in 14 weeks and mature as roasters in approximately two weeks less time; they meet the demand of small families and small ovens; and there is a market differential of from 5 to 15 cents a pound in their favor.

Persons desiring information and advice pertaining to the selection of a variety, which is most suitable for their purpose, should communicate with the county agricultural agent in the community where they are going to operate; describe the system they intend to use in raising turkeys; tell whether they plan to market live or dressed turkeys; and explain whether they intend to sell direct to the consumer or to the wholesale trade. With this background of information, the county agricultural agent will be able to give practical advice concerning the variety best suited for the type of project to be undertaken.

## F. Care of Turkeys

### 1. Brooding

The following information was taken from "Turkey Management" by S. J. Marsden and J. H. Martin.

A satisfactory brooding device should provide the following:

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The temperature near the center of the hover, one inch above the floor, should be 100° F. Near the floor, at the edge of the hover, 95° F. is desirable, and the floor temperature of the room should be kept at about 70° F.

Uniform heat regardless of outside temperature.

Controllable heat that can be adjusted to the demands of the birds at various stages and under varying weather and management conditions.

Safety from fire.

Ventilation under the hover and in the brooder room, sufficient to avoid wet litter and also meet the requirements of the poults for fresh air.

Reasonable first cost and reasonable operating cost.

Heat may be supplied by coal, wood, oil, gas or electricity, the choice depending partly upon the relative cost and availability of the various fuels.

It would be well for growers to consult the county agricultural agent in the community, where they will operate, for advice as to the type of brooder best suited for their purpose.

A practical brooding unit is about 150 poults. Many operators brood from 180 to 250 or even 300 per unit, but it is better practice and less risky to limit the brood to 150. About 1 square foot of brooder-house floor, or floor and porch space, should be allowed per poult if the birds are to be brooded for about 8 weeks.

Brooding time (1 day to 8 weeks) is a critical period for turkey growers, as the start turkeys get largely affects their future development. They must be kept warm, dry, free from draft, have good ventilation, be fed well-balanced rations, be carefully watched to make certain they learn to eat and drink properly, and the brooder house must be kept clean and sanitary at all times.

Many kinds of litter, such as straw, shavings, peanut hulls, shredded cane, and sand are used with varying degrees of success. However, wire floors remove the need for litter and are a help to disease control. Where wire floors are used, sufficient space between the wire and the floor should be allowed for adequate ventilation.

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Compared to chicks, poults are more difficult to brood. They do not learn to eat so rapidly; they are more subject to fright, crowding, and piling; they do not take kindly to changes in feed or equipment; and they are more easily chilled. The essentials of success in poult brooding are good equipment and eternal vigilance. Overcrowding is very dangerous, and large units, over 175 poults, are more difficult to handle than small units. Ample feeding and watering space and sufficient heat must be provided. Getting the poults out into the sun-porches or yards is good practice, but it must be done carefully and the poults watched continuously. If quick and easy access to the brooding room and to the brooder itself is not provided, the poults may crowd together in the corners of the porch next to the house. Boards or wire may be used to guide the poults back into the house openings.

## 2. Feeding

Feed should be kept before turkeys constantly from hatching to market age, and should be put in hoppers or troughs; not on the floor, or ground.

For the first 24 to 72 hours after hatching, poults can live without feed or water, the yolk of the eggs which they have absorbed before hatching being sufficient to maintain them for that length of time. However, the sooner they are fed, the better; and in any event, they should be fed as soon as they are put into the brooder house, in order to prevent excessive eating of the litter. Poults kept from feed and water for more than 24 hours after hatching learn to eat and drink with difficulty. It is common practice to see that the poults are fed and watered within 24 hours after hatching.

The first feed may be starting mash or crushed pellets (granules) upon which is scattered a little oatmeal or tender, finely chopped green feed. These materials should be placed in small heaps on clean boards, pie plates, or cup flats underneath the hover for the first day or two. Pelleted mash may be fed after the first 3 or 4 weeks, but poults do not take well to it at the start—they seem to prefer dry mash or granules. The feeding of liquid milk is not recommended for poults.

Although finely chopped tender green feed is good for poults in guarding against nutritional deficiencies and encouraging them to eat, feeding it is usually impractical due to labor costs and difficulty in obtaining suitable types. Most turkey growers prefer to feed a complete starting mash so as to eliminate the necessity of feeding green feed.



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Poults that will not or do not learn to eat and drink quickly may be saved by force feeding. Make a soupy mixture of regular starting mash with water or milk. Take the small end of a 25-cubic centimeter glass laboratory pipette in the mouth, and by suction fill the pipette with the mixture. Open the poult's mouth, insert the large end of the pipette down the poult's gullet beyond the entrance to the lungs, then force out enough of the food to fill the crop comfortably. One such feeding usually is enough but two or more may be needed in stubborn cases.

Starting mash is recommended for feeding turkey poults during the first 8 weeks. This mash is a complete feed, needing no supplements except water and insoluble grit, such as granite, mica, coarse sand, or gravel, which may be hand-fed lightly on top of the mash.

Diets for growing poults after 8 weeks of age generally include both mash and grain. Oats are a good fattening feed and usually are palatable to turkeys. Turkeys intended for fryers should be fed the mash and whole heavy oats starting at 6 to 8 weeks.

Practically all turkeys raised in the United States are placed on the range and raised without overhead shelter after the age of 12 weeks. In this type of rearing, the environment is expected to furnish vitamin D factor through direct sunshine; make it easier to provide a well-balanced diet; and make a substantial contribution to the diet (about 25 percent of the feed consumed) in the form of growing green feed, from insects, stubble fields, and rice paddies.

When growing turkeys, past the brooding stage, are allowed free access to growing or naturally cured green feed of almost any type that they will eat freely, there may be little fear of the vitamin requirements being satisfied.

Two types of range rearing as follows are used:

a. Limited Range

This involves confinement of the birds to moderate sized and fenced range lots, although there may be an unlimited area of range available.

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When the birds stay on the same area for periods longer than a month, an acre will provide green feed for 50 to 300 birds, depending upon the nature of the vegetation. If, however, the Minnesota Plan which requires a 4-year range rotation is used, an acre would be required for each 50 turkeys. Where a 3-year rotation plan is used, one acre would be required for 67 turkeys.

Permanent crops are desirable. Where there is sufficient rainfall, good results have been obtained from pastures consisting of alfalfa, Bermuda grass, Ladino clover, and other legumes. When it is not possible to grow permanent pastures, such crops as wheat, rye, barley, buckwheat, and sunflowers make good turkey range. In sections of the country where there is little rainfall, various other crops such as blue grass, vetch, cowpeas, fall-rye, and rape are all good forage plants for turkeys.

Local and State agricultural authorities are best qualified and willing to advise regarding pasture and management best suited for the particular area in which the turkey grower is to operate.

b. Open Range

Open range involves the use of a very large range area. There are two types of open range rearing which are compatible with good business principles:

- (1) The fencing of large areas of land suitable for ranging turkeys; and
- (2) The herding of turkeys to provide continuous protection and to prevent straying. Allowing the turkeys to roam at will without liberal feeding is unsatisfactory.

From 9 weeks to marketing, both the growing mash and hen sized scratch grain (no whole corn until the 16th week) are fed ad libitum.

Following are examples of balanced rations which are suitable for turkeys on either limited or open range.

Growing mashes Nos. 1 and 2 are for flocks having continual access to good green range. In mash No. 2, soybean meal

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which has proved to be a good source of protein and also good for fattening, is substituted for meat scrap.

Growing Mash No. 1	Parts by Weight
Ground yellow corn or barley.....	25
Ground oats or grain sorghum.....	25
Wheat Middlings or shorts.....	20
Meat scrap, 50 or 55 percent protein.....	19
Wheat bran.....	10
Salt, fine sifted.....	<u>1</u>
Total.....	100
(Estimated crude protein, 19 to 21 percent)	

Growing Mash No. 2	Parts by Weight
Ground yellow corn or grain sorghum.....	30
Ground oats or ground wheat.....	30
Soybean meal.....	30
Steamed bonemeal.....	6
Ground oystershell or limestone.....	3
Salt, fine sifted.....	<u>1</u>
Total.....	100
(Estimated crude protein, 20 to 21 percent)	

The mash formulas suggested are only a few of many combinations of ingredients. Growing mashes may be made of other combinations of grains, grain by-products, protein feeds, and vitamin supplements, the exact composition depending largely on availability and cost of ingredients. It is best to use two grains, and preferably three or four in a total diet.

Oats usually are very palatable to turkeys, hence are best fed mixed or free choice with one or two other grains to prevent excess consumption of oats. To a great extent, cost and availability of the grains determine the kind of grain fed, as the grains all have about the same value in turkey growing and fattening diets. Oats, common barley, emmer, spelt, rough or paddy rice, buckwheat, and proso, due to their higher fiber content, are worth 80 to 85 percent as much per hundred pounds as corn, wheat, rye, hullless barley, brown rice, and sorghum grains, but when this difference in digestible nutrients is allowed for, they are just as good for growing and fattening purposes.



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Free choice feeding of two or more grains is good practice and does away with mixing, an advantage especially where home produced grains are fed.

Turkeys should be fed as much mash as they will clean up each day. Wet feed of any kind, when allowed to remain in the feeders, will soon sour. In sections of the country where rainfall is heavy, feeders should be covered to prevent the feed from becoming wet and contaminated by souring. Convenient feeders for range use are described under "Housing," page 54.

Water.—Water makes possible the processes of digestion and absorption, transports waste products, softens feed, and cools the body by evaporation in air sacs and lungs. It makes up about 59 percent of the edible parts of dressed, fat turkey males, and 54 percent of females. All feed contains some water, but the principal sources are fresh green feed, liquid milk, and the water supplied for drinking. Water should be supplied freely to all classes of turkeys at all times, except in some instances when liquid milk is fed. Dirty, very cold or hot water is to be avoided. Waterers and methods of supplying water for turkeys on the range are described under "Housing," page 55.

Records of feed consumed each day by large and small turkeys over a period of 24 weeks, show that 4 to 6 pounds are required to produce one pound of turkey meat; also that turkeys raised on the range obtain substantially 25 percent of their feed from insects, grasses, waste from grain fields, and rice paddies, thus creating a saving in the purchase of feed. Where home grown grains are available, additional savings are made. During the last few weeks before marketing, turkeys should not be moved long distances or subjected to radical changes in management or feeding, as this might slow down the finishing process and even result in the loss of weight.

### 3. Cleaning

The following information was taken from "Turkey Diseases" by Hinshaw & Rosenwald; "Turkey Raising" by Marsden; and "Turkey Management" by Marsden & Martin.

Keeping housing and equipment clean and sanitary is the keynote to success for all turkey growers. Brooder houses should frequently be cleaned, scraped, swept out, and then scrubbed, using water (preferably hot) containing a 13-ounce can of lye to 13 gallons of water. Reliable disinfectants such as coal tar products, i.e., cresol solution, may be sprayed on the floor and sidewalls. All equipment used for brooding should first be cleaned thoroughly.

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All litter, including droppings, should be hauled to a place where turkeys cannot reach it. Infection and fly trouble can be reduced by composting or spreading the litter in the sun away from turkeys.

All movable equipment should be removed to a cement run or a cleaning platform.

The walls, floors, and built-in equipment should be scrubbed with lye solution (1 can, or 13 ounces to 20 gallons of water). Apply with an old house broom. Care should be taken by the worker not to get solution on hands, face, or clothes. Vinegar is an antidote. Time should be allowed for thorough drying before poults are put in the house. Lye is too corrosive to use a spray on plaster or concrete, but is excellent for disinfecting wooden or metal (except aluminum) equipment.

Feeders and waterers should be made contamination-proof. All feed and water pans should be on wire platforms or on wire floors, if practicable. The area around water pans should always be dry. All waterers should be kept clean by daily washing with brush or cloth followed by rinsing in clean water. Occasional disinfecting with chlorine or quaternary ammonium disinfectants, sodium orthophenylphenate solution, or other disinfecting solution not leaving a strong odor, may be used if disease is present. However, cleanliness alone usually is sufficient.

Feed troughs must be protected from contamination by keeping them covered with wire or slats having openings sufficient to permit turkeys of various ages to eat. They should be hung high enough from the floor so that the feed will not become contaminated with litter or droppings. Sour feed should never be allowed to remain in the feeders, and receptacles for milk should be washed and scalded daily. For poults only a few days old, feeders will be of wood strips similar to house laths or flat metal receptacles such as pie plates. The wood strips should be disposed of and replaced frequently, and the metal receptacles sterilized daily.

If no disease is present, feeders may be put on a cement floor or cleaning platform, washed with soapy water, and dried thoroughly in the sun.

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If a disease is present, feeders should be washed in soapy water and rinsed; then rinsed thoroughly in boiling water and sprayed with live steam or dipped in a 1 percent solution of formalin; or sprayed with, or dipped in sodium orthophenylphenate or a quaternary ammonium compound, diluted as directed on the package.

Be sure to disinfect equipment, shoes, and overshoes, which have been used in a contaminated pen before entering a clean compartment; or, after they have been used in a pen of older poults before using them in a pen of younger ones. Apply one of the general disinfectants (lye solution, sodium orthophenylphenate, compound solution of cresol, sheep dips).

The wire or slatted floors of rearing pens and all roosts should be kept thoroughly clean; and may be washed down with a garden hose, and scrubbed with a stiff broom or brush, when necessary. All droppings beneath the floor of the pens should be removed at close intervals and disposed of by spreading in the sun to dry or be decomposed in a compost pit or cabinet.

Feed storage houses should be dry and rodent-proof, to prevent illness among turkeys. Cleanliness alone will not eliminate illness or disease in a flock of turkeys, but it will do much to prevent trouble. Growers must expect a certain amount of disease and mortality, but it is better to prevent and control an outbreak in a flock than to try to cure sick turkeys. Diseased birds should be sent to the laboratories of the State experiment farm for diagnosis. The services are free and there is no excuse for guesswork. Dead birds should be disposed of by burning to prevent spread of disease.

#### 4. Feather and Flesh Picking

Feather picking is a mild form of cannibalism to which turkeys are very susceptible during the growing period, especially after they are about 12 weeks of age. It results in unsightly appearance, and more trouble from pinfeathers when the birds are marketed.

There is little trouble from feather picking when turkeys are raised on the range. However, if the trouble does arise, it may be prevented, or stopped completely, by "debeaking," or by a specially made turkey bit resembling a 1-1/4 inch hog ring hanging between the two jaws and adjusted to fit snugly in the



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nostrils of the turkey without penetrating the septum between them. This device prevents the beak from being closed completely, thus preventing feather picking. The "debeaking" should be done, or the bit applied when the trouble starts, usually at about 12 to 14 weeks.

Management practices that tend to prevent feather picking are: (1) Placing tightly stretched 11- or 12-gauge wire on the feeders for beak-cleaning; (2) providing 3-1/2 to 4 inches of feeder space per growing turkey, rather than the minimum allowance; (3) feeding an adequate diet; (4) feeding whole oats in fairly large proportion--about 50 percent of the grain portion of the standard mash-grain diet; (5) not confining turkeys to roosts or restricted quarters, particularly in the early morning.

Head and neck picking occasionally results from fighting. Fighting usually is not serious among turkeys raised on the range, as the injured birds have ample opportunity to escape.

Pine tar or chick-pick remedies, such as a mixture of 4 ounces of petrolatum, one-fourth ounce of carmine, and one-fourth ounce of aloes applied to the affected area, offer temporary relief from picking.

#### 5. Diseases, Pests, and Common Ailments

Information on this subject was obtained from Farmers' Bulletin No. 1409, "Turkey Raising," and Farmers' Bulletin No. 1652, "Diseases and Parasites of Poultry;" "Turkey Management" by Marsden and Martin; and "Starting Right with Turkeys" by G. T. Klein.

At the slightest indication of disease, turkey growers should consult the county agricultural agent for advice; and, irrespective of sight, the services of a veterinarian should be obtained, since the diagnosis and treatment of disease require special knowledge, skill, and experience.

The best way to fight disease in turkeys is by prevention and control, not by trying to cure sick birds. Not too much is known about how to care for a turkey once it gets sick; therefore, growers must expect some mortality.

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## a. Prevention

Prevention is too often thought of only in terms of impractical cleanliness. In practice, no one expects the poultry house to be spotlessly clean and free from germs; and cleanliness alone, although vitally important, will not prevent all disease.

Listed are some of the weapons and a plan of action poultrymen can use to prevent and control disease, parasite, and vice outbreaks in their flocks. They were taken from a reliable poultry manual published by a manufacturer and distributor of poultry feeds and insecticides. Each has its important place in the practical disease control program, and includes:

## (1) Seven Weapons to Combat Disease--

- |                              |                  |
|------------------------------|------------------|
| (a) Blood testing breeders   | (e) Vaccines     |
| (b) Common sense cleanliness | (f) Insecticides |
| (c) Complete nutrition       | (g) Drugs        |
| (d) Mechanical devices       |                  |

## (2) A Plan of Action to Keep Disease and Mortality at a Low Level--

- (a) Buy poults from a hatchery having pullorum-free breeding stock only; a sound sanitation program; and one that controls breeding flocks supplying its hatching eggs.
- (b) Get poults in new boxes and use feed from new bags.
- (c) Keep brooders and laying houses clean and dry.
- (d) Allow no mudholes, piles of trash, boards, or manure around poultry houses.
- (e) Keep unnecessary visitors out of poultry houses.
- (f) Don't wait for a seriously sick poult to die--get rid of it at once.
- (g) Burn or bury all dead birds immediately.
- (h) Keep poults away from growing turkeys.

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- (i) Vaccinate against fowl pox, Newcastle disease, and bronchitis if they are a threat in the area.
- (j) Keep poultry houses free of lice and mites.
- (k) Rats, insects, and wild birds should be kept out of poultry houses.
- (l) Use drugs where they effectively help prevent or control disease. Remember, no drug is a "cure-all."
- (m) Feed is important in any disease prevention program. Follow the recommended feeding program that fits the needs of the flock so the birds will be fortified with good health that comes from complete nutrition.

## b. Common Diseases

In this section is listed some of the most common diseases, pests, and ailments affecting turkeys. Each is described according to its nature, symptoms, cause, and method of treatment.

Blackhead.--Blackhead is primarily an infectious disease which attacks the ceca and liver of turkeys; and may occur at any time in the life of a turkey, but is most serious in young birds. The fact that the head of the affected bird may become discolored has given it its popular name, blackhead.

Symptoms--Drooped wings, drowsiness, ruffled feathers, weakness, loss of weight, and sometimes a sulphur-colored diarrhea are the main symptoms. Death is often sudden. The discoloration of the head is seen also in other diseases and is not always present in this disease, so that the term "blackhead" is not a very satisfactory one. Post-mortem examination will show the liver to be enlarged and often spotted with dark red, gray, or yellow circular areas.

Cause--The parasite (*Histomonas meleagridis*) causing blackhead is one of the protozoa. The organisms live part of the time free in the cavity of the ceca or blind pouches; but in another stage of the disease, they apparently enter the walls of the ceca and are probably carried through the blood stream to the liver. The organisms in the ceca multiply in large numbers and pass



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out in the droppings. When the eggs from the droppings are eaten, in contaminated feed or water, and hatch in the intestinal tract, the blackhead organisms are transmitted to the bird and set up the disease.

Treatment—Although many drugs have been tried and some are recommended for the treatment of blackhead, none have been found to be of practical use. Control measures to prevent development of the disease is the only practical procedure.

Complete separation from chickens is of fundamental and paramount importance. Clean ground must be provided at all times. To avoid soil-borne diseases, the turkey grower should provide: Land not used by poultry for two years or more; land not contaminated by drainage water or poultry manure; land well separated from previous range; land naturally well drained; range consisting of grass, ladino clover, alfalfa, or other good pasture; areas around waterers kept dry; feeders moved to a clean spot each week; and prevention of transfer of contamination by visitors, animals, vehicles, etc.

Coccidiosis.—This disease is less severe in poults than in chicks, and if observed in time can be checked with less setback to the flock. Coccidiosis makes its appearance in poults from 5 to 16 weeks of age, although occasionally as early as 3 weeks. It is more common in poults, naturally brooded, as the mother hen serves as the source of infestation. The species which infect turkeys are different from those commonly troublesome to chickens, so cross-infection does not occur.

Symptoms—Drooped wings, ruffled feathers, listless appearance, diarrhea light brown and mucoid rather than bloody, although blood occasionally appears as the disease continues to run its course.

Cause—Infestation with parasitic organisms especially of the genus *Eimeria Meleagridis*, a one-celled protozoan. The organism multiplies in the bird's body, so that considerable numbers of the parasite are later passed in the droppings. As a result the infection is spread to other birds. The organisms may be carried or spread by flies, birds, insects, rats, and mice.

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~~Treatment~~---The drugs sulfagaunidine or sulfamethazine recently have been found to possess curative properties. It is administered at the rate of 0.5 percent in the dry mash for two or three consecutive days, water but no other food being given. This treatment is sometimes given as a preventive, during the fourth or sixth weeks of brooding, in situations where coccidiosis threatens the flock.

Pullorum.--Pullorum is a destructive, typically diarrheal disease, formerly called bacillary white diarrhea; and is widespread, existing in every section of the United States where appreciable numbers of poultry are raised. The disease is usually acute, with losses up to 30 to 50 percent or more. The most susceptible age is from the first week through the third week, although heavy losses have been experienced as late as three months of age.

~~Symptoms~~---Droopiness, huddling together in warm places, ruffled plumage, skin on legs dry and wrinkled, and listless picking at feed. In cases not so acute, there is often a pasting up around the vent and labored breathing which indicates infection in the lungs. The droppings may be whitish, foamy, and sticky.

~~Cause~~---The disease is caused by a germ which is known as *Salmonella pullorum*. The organism may be transmitted in the egg or by contaminated feed and water. Although the germ is quite easily destroyed by direct sunlight, heat, or disinfectants, it may remain alive in soil or manure in sheltered places for many days, or even months. The primary seat of pullorum infection is the ovary of the infected hen.

~~Treatment~~---The sulfa drugs have been reported as successfully used to prevent death losses from pullorum disease. Pullorum control involves obtaining eggs from disease-free flocks; hatching them in disease-free incubators separately from chicken eggs; and brooding and rearing the poults away from chickens, infected turkeys, and contaminated land or equipment. Blood testing of breeding stock is essential to an effective means of combating the disease.

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Erysipelas.-- This disease, though uncommon, may cause losses in turkeys, mostly males, near market age. It is caused by the swine erysipelas organism, *Erysipelothrix rhusiopathiae* transmitted by sheep or swine.

Symptoms--Listlessness, drooping, aloofness, cyanotic (dark blue) head, nasal catarrh, swelling of the snood which may fall off, and fever of 2 to 3 degrees.

Treatment--Affected birds may be saved by prompt injections of penicillin in proper dosage; 20,000 units of oil, 4 doses given 24 hours apart. Streptomycin (a single dose of 140,000 mcg.) proved 100 percent effective, while 80 percent of the untreated died, in a test by C. C. Grey (1947).

Caution: Erysipelas is transmissible to humans and may cause an itching rash on the skin. Always keep turkeys from contact with sheep or swine, especially where erysipelas has occurred previously.

Newcastle Disease.--Newcastle disease, also known as avian pneumoencephalitis, is a highly contagious virus disease involving primarily the respiratory and nervous systems of domestic fowl. It is characterized by a sudden onset and an extremely rapid spread through a flock. Turkeys are very susceptible. The time between exposure and appearance of symptoms may vary from 2 to 14 days. The average time is generally considered to be about 5 days. The disease may be spread by direct or indirect contact. It may be carried from one farmyard to the next by visitors, such as poultry buyers, feed deliverers, and remedy salesmen. The practice of feed dealers of collecting used feed bags and reusing them causes some outbreaks of the disease. The virus may survive on infected premises for 2 or 3 weeks following an outbreak of the disease; and it is recommended that poultry houses be vacated for at least 30 days before being restocked.

Symptoms--Newcastle disease begins with respiratory symptoms resembling those of infectious bronchitis and laryngotracheitis. The first symptoms observed are difficult breathing accompanied by gasping. Some turkeys emit a peculiar shrill cry which may be heard above the other sounds in a poultry house. The birds are



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visibly depressed and weak. A few days after the respiratory symptoms appear, nervous disturbances are encountered. The birds may lie on their sides, with paralysis of one or both legs or wings. The equilibrium is so altered so that birds may do somersaults, turn over backwards, walk backwards, or twist the head and neck into all sorts of contortions. Tremor of the head is common.

Treatment--Medicinal treatment is of no value in this disease. Approved methods of poultry management should be followed to avoid introduction of the disease into a flock. Recovered birds may become carriers of this disease. Admission of visitors from potentially infected premises should be avoided.

## c. Pests

Lice.--Four species of lice are found on turkeys. The large louse (*Gonoides meleagridis*) and the slender turkey louse (*Lipecurus gallipavonia*), are restricted to the turkey and may be markedly injurious to poults and may also cause severe annoyance to adult birds. The common body lice are found on both turkeys and chickens and may cause considerable irritation to both young and grown birds. The shaft louse may be present, without evident bad effect. High mortality among hen-hatched or hen-brooded poults may result from infestations of head and body lice.

Symptoms--Young poults fail to grow normally, mature birds may be in poor flesh. Lice may be seen easily by examining the upper thigh feathers and the bases of the fluff feathers below the vent. The unhatched whitish louse eggs (nits) may be seen in clumps about the base of the feathers. Some kinds of lice breed on the bird's body feathers, others on the head; young and old lice remain on the turkeys. Lice are yellowish to grayish in color, about 3/16" in length.

Treatment--Apply sodium fluoride among the feathers, working it well down to the skin, one pinch at a time on the head, the neck, the back, under each wing, below the vent, above the vent, and in the long fluff feathers on each side. Baby poults should not be dusted with sodium fluoride or any strong louse powder until more than a week old, and even then the powder should be applied sparingly. If turkeys are roosting in a house,

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lice may be controlled by applying a thin line of nicotine sulphate solution on the top surface of all roosts. Where a general delousing is needed, this method is effective and easily administered. Control of lice involves the destruction of the parasites and nits (1) on the birds themselves, and (2) in the house and litter.

Mites.—Red mites often flourish unsuspected in turkey roosting or nesting quarters, which should be inspected periodically. The presence is indicated by grayish deposits or by the tiny mites themselves, which are red after feeding on the turkey's blood.

Symptoms—Loss of vitality and color indicates a loss of blood due to mites. The scaly-leg mite crawls under the scales of the shank causing the entire shank to appear rough, and the bird sometimes becomes crippled.

Treatment—Paint the underside of the roosts and roost supports with anthracene oil, crude oil, crankcase oil, or any coal tar disinfectant. Make the application light but thorough, and do it preferably in the morning.

Ticks.—The fowl tick, or blue bug, is one of the worst pests of turkeys in the warm sections of the country. It is a large insect resembling a bedbug, and can be controlled by the methods advised for controlling red mites, but the treatment must be thorough and persistent.

Worms.—Turkeys are subject to attack from various species of roundworms, tapeworms, flukes, gapeworms, and gizzard worms. Treatment should not be undertaken until the presence and identification of the worms have been determined by examining the droppings or by post-mortem examination. Worm infestation can be prevented by sanitation and by the control of immediate hosts, such as flies, grasshoppers, beetles, and other carriers.

Symptoms—Loss of weight, sagging wings, paleness, and occasionally diarrhea. However, birds may be fairly heavily infested and yet appear healthy. In most sections of the United States worms do not infest turkeys to any serious extent; yet in a few areas they may be troublesome. The ripened eggs pass through the droppings, incubate in the soil and litter, and soon infest other turkeys.

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Treatment—Four percent of tobacco dust ( $1\frac{1}{2}$  percent nicotine) in the mash, fed continuously, is considered to be an effective control; however, any sanitation program that will avoid trouble from blackhead usually eliminates roundworm infestation. The use of worm remedies without a competent post-mortem examination, to prove the presence of a serious worm infestation, is to be discouraged.

Manson's Eye Worm.—The parasite (*Oxyspirura mansoni*), known as Manson's eye worm, infests chickens, turkeys, and peafowls, and can develop in various wild birds. This worm has an indirect life history, and its intermediate host has been shown by workers of the Florida Agricultural Experiment Station and elsewhere to be a cockroach. The cockroaches are found beneath boards, trash, and in the vegetation at the edges of fences; they feed on whatever food is present, including droppings of the fowl. From the droppings, the cockroaches obtain the eggs or newly hatched larvae of the roundworm, the eggs having been washed down the tear ducts from the eye of the fowl and having then been swallowed and passed in the droppings. The young roundworm develops in the body of the cockroach; and when the roach is eaten by a fowl, the worm is freed in the bird's crop. It passes up the esophagus to the mouth and then through the tear ducts to the eye.

Symptoms—Affected birds wink the eye continuously and frequently attempt to rub the head on the feathers of the wing, or to scratch at the eye with the foot. The eyesight is not good. There is puffiness around the eye and a discharge from the eye and from the nostrils. Often a severe inflammation may result in blindness; at times, the entire eyeball is destroyed.

Cause—The parasite, *Oxyspirura mansoni*, is found under the nictitating membrane, i.e., the transparent membrane which passes over the eyeball of the fowl in the act of winking. The worms are slender, colorless, and about  $\frac{3}{4}$  of an inch long. They can often be detected by a firm pressing of the tear sac at the inner corner of the eye, when they will wiggle out over the eyeball.

Treatment—Two or three drops of a 5 percent solution of butyn should be dropped in the eye as an anesthetic. The transparent membrane should be lifted to place one or two drops of a 5 percent solution of liquor cresolis on the worms. The eye should then be washed well with warm water.



Raising Turkeys on the Range (Contd.)

## d. Common Ailment

Bumblefoot.--Bumblefoot in turkeys is abscesses of the foot pads. The ailment is seldom serious except in Broad Breasted Bronze. Bumblefoot may be confused with Staphylococcosis, a bacterial infection that sometimes causes swollen feet.

Symptoms--The abscesses have the appearance of corns. They are boil like infections and the bottom of the feet may be swollen. In severe cases the infections look like foot rot in other animals. The birds are lame. Growth is retarded and the weight reduced.

Cause--The real cause is not known. The probable cause is bruising or cutting of feet followed by an infection. Floors with rough edges and projecting points may result in moderate bumblefoot in all turkeys and serious bumblefoot in Broad Breasted Bronze.

Treatment--There is no cure for bumblefoot once it develops. If the birds get abscesses, put them in dry, clean quarters and treat the pads with tincture of iodine or an antiseptic healing ointment such as ammoniated mercury or sulfa.

Floors made of poles or slats, having round edges, and roosts low enough to prevent bruising of feet when the birds hop to the floor, have possibilities in the prevention of bumblefoot.

G. Methods Used by Blind Persons in Detecting Signs and Symptoms of Diseases and Minor Ailments in Turkeys

To obtain accurate information on conditions which are warning signals of approaching trouble, contacts were made with turkey growers, both blind and sighted; county agricultural agents; veterinarians; specialists; and pathologists from the U. S. Department of Agriculture.

Whether blind or sighted, it is vitally important that turkey growers be able to detect the first signs of disease in their flocks, in order that treatment may be administered to prevent the outbreak from becoming widespread and financial loss serious.

Naturally, totally blind persons and persons with seriously impaired vision have difficulty in detecting the symptoms of certain kinds of illnesses; and when raising turkeys on the range, they

Raising Turkeys on the Range (Contd.)

must rely on sighted help for information. It is for this reason that arrangements should be made for someone, such as a sighted member of the family, a neighbor, or a supervisor provided by a feed dealer, to look the flock over, at frequent intervals, and advise the blind person regarding its condition. In all instances, even though sighted assistance is provided, the services of the county agricultural agent are of vital importance; and arrangements should be made for him to make regular inspection tours and advise the blind operator regarding the condition of his flock, in order that he may follow the best practices and use the proper methods to prevent disease.

### 1. Conditions

In the raising of turkeys for meat, there are two definite conditions that indicate approaching trouble and can be identified by sound or touch.

Inactivity.--Healthy turkeys are alert and active. They cheep, chatter, eat well, run and jump to catch insects, and fly at the slightest disturbance. The absence of any of these traits is an indication of trouble.

It is, of course, extremely difficult to detect these symptoms in a few turkeys when the flock is feeding on the range. However, it is the experience of blind poultrymen that when turkeys are confined to brooder houses and rearing pens, or the system of corralling turkeys for grain feeding is used, even a few birds which fail to respond to fright and squat listlessly on the ground are easily located by the attendant touching them with his feet. With these warning signals, a blind person will know to call the county agricultural agent, or a veterinarian to analyze the difficulty and to administer such treatment as may be necessary to prevent, or at least lessen the seriousness of disease in the flock.

Decrease in Feed Consumption.--Good poultrymen carefully weigh and apportion the quantity of feed to be consumed daily by their flock. When the birds fail to eat all of the feed, it is an indication of approaching trouble. The blind poultryman, of course, easily detects this condition by running his hand into the hopper containing the feed. One county agricultural agent has the following to say:

"Feed consumption usually drops one or two days before outward symptoms of sickness are noticeable. By measuring out just the right amount of feed needed each day and placing it in the feed hoppers early each

Raising Turkeys on the Range (Contd.)

morning, a blind person will know that there is something wrong with his flock if any feed is left in the feeders from the day before. He can then call the county agricultural agent or someone else to immediately make an early diagnosis, so that remedial action can be taken before the trouble reaches an advanced stage or gets completely out of control. A person with sight will often wait until he sees outward symptoms of trouble before taking action. Sometimes this is rather late."

A representative of a large feed concern, who is an authority on the raising of broilers, has this to say:

"By keeping daily records of feed consumption, you can notice a decline as soon as it appears. Correcting a problem in its development is much easier than suddenly to find out your flock is 'off feed' and a serious respiratory outbreak is affecting the growth and uniformity of your broilers."

## 2. Examples of Diseases Detectable by Touch, Sound, or Both

Touch.—Many ailments in turkeys are identified by touch. The birds droop, squat, are listless, or remain under foot, all of which are indications of some kind of approaching sickness, such as coccidiosis and hexamitiasis, blackhead, trichomoniasis, pullorum, infectious sinusitis, Newcastle, and erysipelas. (For symptoms see preceding section on Diseases.)

Sound.—All respiratory diseases are easily detected by sound. The birds gasp for breath, sneeze, wheeze, or have rattles in their throats, all of which are indications of approaching sickness, such as infectious sinusitis (air sac), Newcastle, pneumonia, and bronchitis. (For symptoms, see preceding sections on Diseases.)

Note: Infectious sinusitis and Newcastle may be detected by either sound or touch.

## H. Marketing

### 1. When to Market

According to information contained in "Farmers' Bulletin 1409," U. S. Department of Agriculture, experiments with standard-bred and Broad Breasted Bronze turkeys have shown that well fed young birds of these varieties are marketed to best



Raising Turkeys on the Range (Contd.)

advantage at ages ranging from 26 to 30 weeks, the average being 28 weeks. Under the most favorable conditions, hen turkeys of these varieties may be ready for market as early as 24 weeks and the toms at 26 weeks. However, many are marketed at 24 to 26 weeks that are somewhat deficient in fat and possess numerous short pinfeathers. In general, if turkeys are kept longer than 30 weeks, the cost of further grains and the extra labor for their care cause the cost of production to rise rapidly.

Small type varieties are ready for market at 22 to 26 weeks of age; however, with proper feeding and management, they may be marketed at 14 weeks as broilers. As with the larger varieties, conditions of rearing may affect the time required to produce market birds. Cool weather, during the later growth stages, tends to speed up growth and subsequent maturity in all types of turkeys.

## 2. Selecting Turkeys for Market

If rearing conditions have been satisfactory, the inspection of a few representative birds will serve to tell whether or not the flock as a whole is ready for market at the usual age. Under most conditions, it is important to market only turkeys which are fat and free from short, unpickable pinfeathers. To determine market quality, suspend the bird by the legs and examine the skin around the shoulders, over the breast, and on the drumsticks for presence of pinfeathers too short to be cleanly picked without leaving a deposit of feather pigment in the skin. If noticeable numbers of short pinfeathers are present, the bird will not pick clean.

Defects due to injuries before and after the birds are killed are common and cause loss of grade. Great care should be taken not to allow the birds to bruise themselves by flying or running against obstructions or by piling up; therefore, smothering and trampling each other. The use of a catching chute or a small catching pen is recommended. A strong catching hook is useful.

## 3. Shipping Live Turkeys

In shipping live turkeys, it is a good plan to consult the buyer and transportation company regarding details of crating and handling.

Careful handling of turkeys will do much to insure top prices. Birds with broken legs and wings, and bruises due to rough handling, go into lower grades and sell at lower prices.

Raising Turkeys on the Range (Contd.)

Crowding too many birds into the market coop may result in some being smothered or trampled and scratched so badly that they are almost a total loss. Allow room for all of the birds to stand fairly comfortably in the coop.

Coop size is important. It should be deep enough to allow the birds to stand, but no deeper. Shallow coops force the birds to rest on their breasts, which if bruised, results in a lower grade classification. A height of 18 inches is recommended for turkeys.

Since turkeys frighten easily and fly, thus bruising their flesh and frequently breaking bones, it is advisable to use a catching chute when catching and crating for market. The use of a catching chute prevents turkeys from piling, and enables the operator to catch them by the legs without being seen. One type of chute is 4' to 8' long by 24" to 30" wide and 3' high. The top is solid and there is no bottom. There is a sliding gate in each end and a set of fencing wings for one end. One or both sides may possess a slatted or wire covered framework which is covered with burlap coming to within an inch of the ground. The slatted framework comes to within about 12" to 16" of the ground. Birds are driven into the chute by way of the wings and are removed easily by the legs from under the burlap.

#### 4. Processing Turkeys for Market

Marketing dressed turkeys requires much more experience and special equipment than the average producer possesses or the size of his project warrants. Dressing turkeys for shipment is a rather hazardous business, and a careful study should be made before dressing is attempted. It would be advisable to arrange for some demonstrations before attempting to dress turkeys on a large scale. See the county agricultural agent for details.

In farm processing plants, turkeys are usually killed by one of two methods--cutting the bird's throat from the outside or from the inside. Cutting from the outside is the most popular method. Regardless of the method used, the large vein and the cross vein should both be cut.

In the standard method of slaughtering and picking, the bird is hung up by the feet with the head held in one hand by the operator. Barrels, funnels, and shackles hung from the ceiling, or line, rope, or cord hung from ceilings or pipes are

Raising Turkeys on the Range (Contd.)

used in killing and bleeding poultry. Killing by cutting the birds' throats from the outside and throwing them into barrels is the most efficient method from the standpoint of time and travel. However, from the standpoint of quality maintenance, carcasses of birds put into funnels or hung by shackles are superior, as the muscular spasms of birds thrown into barrels cause bruises.

Wet picking is the method most commonly used today. Birds are immersed in hot water ranging in temperature from 128 to as high as 190° F. Turkeys are often wet picked after being in water at a temperature of about 139° F, for a period of approximately 30 to 35 seconds for young birds, and from 40 to 50 seconds for adult birds. The time of immersion in a scalding tank depends upon the temperature of the water as well as the kind, class, and age of the birds. Experimental work on the part of the turkey grower is necessary to ascertain the scalding time and temperature required to prepare birds to suit consumer demands. Since it is necessary for the hot water to reach the skin of the birds, the water in the scalding tank should be agitated during the immersion, or the birds should be kept in continual motion while in the water. Scalding tank water should be kept clean. This is important as some of the scalding water may be absorbed internally by the birds; or when the external skin is torn, dirty water may cause the flesh to become contaminated.

There are two methods of picking turkeys--machine and hand. Machine picking is much more rapid than by hand. However, mechanical pickers need frequent attention from the standpoint of cleanliness; otherwise, all the carcasses may become contaminated by the continued accumulation of filth.

Picking by hand is the most common method, and a definite and desirable order for the removal of feathers is as follows:

1. Main tail feathers
2. Primaries and secondaries of the wings
3. Back
4. Legs
5. Area around vent
6. Contour feathers of the wings
7. Breast
8. Neck

A small handful of feathers should be pulled at a time, especially on the breast and thighs which are easily torn.



Raising Turkeys on the Range (Contd.)

Pinfeathers can best be removed by use of a poultry pinning knife or other instrument such as a strawberry huller. When pinfeathers cannot be removed without digging into the skin, they should be allowed to remain because a skin injury is worse than a pinfeather.

After pinning, the birds are singed by rotating them while being passed over a flame, in order to remove the hairs. On farms, singeing is done by use of bottled gas, a blow torch, an alcohol burner, or a kerosene burner.

Feed is stripped from the crop by massaging the crop and neck and forcing the feed out of the mouth. This is preferable to making an incision as it lessens the danger of spoilage and gives the bird a better appearance. Vents are squeezed to force out the fecal matter which may still be in the lower intestines. This is accomplished by pressing on the abdomen just below the vent.

In the final washing, the carcasses should be passed through a spray or sprays which provide an abundant supply of fresh clean water either under pressure or for scrubbing action.

Rapid chilling is essential in maintaining high quality of fresh killed poultry. Chilling increases the length of time that birds may be held without off-flavors developing. There are two general methods of chilling used on farms--ice and water chilling and air chilling. Ice chilling is most often used.

In most farm processing plants, hogsheads, milk coolers, or large metal or hard-surfaced tanks are used for ice and water chilling. All containers and equipment should be thoroughly cleaned with hot water and soap at least once a day. Only ice produced from water, suitable for drinking, should be used in vats or tanks. A temperature under that of 40° F., should be maintained at all times during chilling. Chilling tank water must always be clean. Only perfect and thoroughly cleaned birds should be placed in the chilling tanks.

The length of time carcasses should be allowed to remain in chilling tank is as follows: birds of less than 8 pounds, 6 hours; birds 8 pounds and over, 8 hours; or when the internal temperature has reached 36° F.

### Raising Turkeys on the Range (Contd.)

In air chilling (unless the birds are dry picked) after being passed through a spray of clean water, the birds should immediately be hung on racks, ropes, or shackles.

#### 5. Marketing Procedures and Trends

The marketing season for the bulk of the turkey crop usually is comparatively short, extending from early November through late December. However, there is an increasing demand in the winter and late summer for fresh roasting turkeys and a year-round market seems likely to be developed soon. Many turkey raisers sell their birds alive to poultry dealers who either dress or ship them alive to city markets. In sections where turkeys are grown in large numbers, dressing plants have been built by cooperative associations or by poultry processors who collect the birds and dress them for market.

Farmers near city markets often dress their turkeys and sell them direct either to the consumer or to city retail dealers. In territories adjacent to large cities, marketing of both live and dressed birds at roadside markets has become common. Some growers have developed profitable gift-package businesses, delivering by truck, express, or parcel post. The dressed turkeys are shipped in sealed packages containing dry ice--about 1 ounce of ice per pound of turkey.

In certain localities, turkey growers may take advantage of the unique method of marketing turkeys by conducting a "Turkey Shoot." A true example is that of a small grower who began with 150 poults. When marketing time came, the owner, who was quite a sportsman, decided to hold a "Turkey Shoot." He furnished the shells and charged \$1 for each shot. The number of chances or shots was determined by the number of pounds of live weight per turkey; thus, an 18-pound turkey at \$1 per shot would net \$18 minus the cost of the 18 shells. This method of marketing proved so satisfactory and successful, that over a period of 6 years he built his turkey business up to 750 or 800 turkeys per year, each of which was marketed through shooting matches held from the first of November through the end of December. This brought a tremendous profit in comparison to the normal or conventional methods of marketing poultry.

New marketing developments which have helped to popularize turkey meat and definitely appeal to homemakers are: eviscerated turkeys (whole) ready for the oven and sometimes stuffed with dressing; turkeys cut into halves, quarters, steaks, or similar pieces; and the availability of the small type turkey.

Raising Turkeys on the Range (Contd.)I. Record Keeping

The many details which are of vital importance to the success of poultrymen make some form of record keeping a necessity. A good system of records keeps the business on a sound basis; reflects the economic possibilities of poultry; develops business leaders; provides poultry raisers with helpful and timely information; and assists in establishing a favorable credit rating. Daily records should be kept of feed consumption, expenditures, and income.

Turkeys should be given all the feed they will clean up. The kind and amount they eat will increase with their age, and any decrease in feed consumption is an indication of some form of approaching trouble. For this reason it is necessary to carefully weigh, and keep a daily record of all feed consumed by turkeys of different sizes and ages. Record keeping cards for this purpose can be obtained from all feed stores; poultry growers associations; and the State Departments of Agriculture.

Successful turkey growers keep a detailed accounting of all expenditures and income as follows: Costs of poults; cost of buildings and materials for constructing fences, range equipment and other facilities; brooders; waterers; feeders; tools; feed (starting mash); seeding; pastures, grain, and oyster shells; medicine; disinfectants; insecticides; veterinarian services; insurance; interest; electricity; water; depreciation of buildings (5 percent per annum); brooders and other equipment (10 percent per annum); loss of poults from death or other causes; transportation; and when the project is not a full time operation, man-hours of labor.

Income from all available sources should be carefully recorded. It may include returns from the sale of live or dressed turkeys; turkeys eaten by the family (credited at prevailing market prices); and by-products, such as the sale of fertilizers and feathers.

Account books especially compiled for the use of keeping records of expenditures and income of farm projects may be obtained from State Departments of Agriculture.

J. Training

Training in the proper use of scientific methods of poultry management and modern equipment is of the utmost importance to poultrymen, whether blind or sighted.



Raising Turkeys on the Range (Contd.)

Information obtained from bulletins published by the U. S. Department of Agriculture, State Departments of Agriculture, and associations interested in research and improvement of the poultry industry, proves that the most successful growers are trained persons who avail themselves of every opportunity to improve their methods and increase their knowledge of the poultry business.

Irrespective of sight and training, everyone is not suited, either by temperament or physical make-up to be a poultryman. Therefore, it is important that blind persons, before planning a training program for the raising of turkeys, make certain they possess the abilities and qualifications essential to their happiness and success. They should be mobile; well adjusted to their blindness; able to qualify for the job of raising turkeys on the range as described under "Job Specifications," (Section IV, page 91) like living in the country; possess at least average ability to do simple construction work and make minor repairs on buildings and equipment. They must like the kind of poultry they are to raise; have no aversion to working with sick poultry or performing the somewhat distasteful tasks of cleaning and sterilizing dirty, foul smelling poultry houses; be able to take reverses without becoming unduly discouraged; like to work alone; have no objection to being tied closely to their work and kept at home; be willing to work long hours; like to attend to details; be punctual and perform their duties regularly; and be willing to meet emergencies as they arise, day or night.

After careful consideration has been given to the many factors affecting the lives of individuals, and it seems reasonable to assume they will be successful in raising turkeys, a comprehensive program of training which will meet the needs and desires of the individual should be developed. The training plan should be written out in detail. Where training supplies, materials, or equipment is required, the trainer, all materials, equipment, and supplies should be approved by the county agricultural agent, the State Commissioner of Agriculture, or some other recognized authority.

The kinds and amount of training required to fit blind persons for raising turkeys on the range will vary in individual cases. It will depend upon such things as their background of experience, education, skills, knowledge of poultry and poultry work, and the methods they plan to use in raising and marketing turkeys.

Turkey growers, especially operators of small and medium size projects must possess a wide variety of skills (in addition to their knowledge of turkeys), for their responsibilities are those of manager, planner, supervisor, laborer, and businessman.

Raising Turkeys on the Range (Contd.)

Operators of large projects may not take part in the daily work of caring for turkeys and constructing and repairing equipment. Therefore, the variety of skills they possess need not be so diversified, since they must employ several workers, each of whom must have the ability to perform the different tasks that are essential to the success of the project.

Before undertaking to raise turkeys, it is strongly recommended that blind persons who have not acquired the necessary knowledge and skills through experience or working with others engaged in the business, should take a course of training in the care of poultry, poultry management, and farm shop work.

Some of the training programs now in operation are described in the following paragraphs:

1. In a few States, the agency providing vocational rehabilitation services for the blind and the College of Agriculture work together in organizing and conducting farm training for the blind.

In some instances, persons are enrolled as special students and receive instruction through lecture courses, class discussion, and supervision in the physical performance of the details of the daily work as it is conducted on the college farm.

In other instances, specialists from the various farm divisions of the college serve as consultants and advisers to the vocational rehabilitation counselors working with farm clients. The counselors then confer with the county agricultural agent and select an experienced and successful farmer, who observes, supervises, and assists the trainee in the operation of his project which has been set up on his farm. The farmer who acts as supervisor makes regular reports on the progress of the trainee to the rehabilitation counselor and county agricultural agent.

2. A private agency, the Cincinnati Association for the Blind, operates a farm school for the blind at Mason, Ohio. Courses are offered in the care of poultry and poultry management, dairying, bee keeping, hog raising, farm maintenance, and farm shop work. As the demand arises, other courses are added to meet the needs and desires of individual trainees.

Raising Turkeys on the Range (Contd.)

Trainees attend lectures given by specialists from the various divisions of the agricultural college, and take part in the daily work under the immediate supervision of their instructors and the superintendent of the farm. In addition, trainees are given instruction in orientation to a farm situation and afforded an opportunity to participate in outside activities which are of interest to farmers (Grange meetings, and special classes conducted under the direction of the home demonstration agent, county agricultural agent, and instructors of vocational agriculture). Upon completing training at the farm school, some State vocational rehabilitation agencies assist the trainee in setting up a project on his own farm under the immediate supervision of the county agricultural agent. A reputable farmer supervises and advises him on the best methods of operation. The farmer and the agent also make regular reports on the trainee's progress to the Vocational Rehabilitation Counselor.

3. One State Agency, Missouri, has a farm training program which it operates on a 143-acre farm under the direction of the owner, who is a graduate in agriculture, a successful farmer, and has about 5/200 vision. Programs are set up to meet the needs and desires of the individual trainees; and in most instances, extend over a 9-month period.

Before completing a course, each trainee takes over the entire management of the farm for one month, and outlines the plan he intends to follow on his own farm.

The rural specialist makes frequent checks on the trainee's progress and assists in setting him up on his own farm, where he completes his training under the supervision of the county agricultural agent.

4. Most State agencies have no regular plan for training clients to become farmers or farm workers. Individual training plans are made by the rehabilitation counselor as the demand arises; and such trainers as feed dealers, individual farmers, and county agricultural agents are employed to observe, advise, and supervise the projects. Trainees, under this plan, acquire their knowledge from supervised work experience and reading of textbooks and bulletins published by authorities on the particular farm activities in which they are interested. In some instances, on-the-job training as a farm worker is considered most practical.



### Raising Turkeys on the Range (Contd.)

When training, as described in this section is given a client, it is of the utmost importance that regular reports of the trainee's progress be made to the vocational rehabilitation counselor, in order that he may evaluate the training and provide additional assistance as may be necessary.

### Cost of a Training Project

No attempt will be made to estimate the cost of purchasing land or erecting buildings. These factors fluctuate and differ greatly in the various parts of the country and will be governed by local conditions and personal situations. Many persons own or have access to a small piece of land in the suburbs, a small acreage in the country, an unused portion of a general farm or grazing land, which could be used for raising turkeys on the open range. Frequently, the property has unused buildings on it, such as a garage, poultry house, or shed that could be converted into sanitary and convenient quarters for turkeys. Often there is sufficient scrap lumber about the place to make alterations and construct range equipment, and a person who is handy with tools can do the necessary work with little or no financial outlay. The utilization of these materials cuts the financial outlay for equipment decidedly and requires mainly initiative and skill on the part of the operator. When it is necessary to purchase lumber, nails, and a few incidental items, the cost will be very little.

Since it is impossible to know all the conditions and circumstances affecting the starting of a project, the example, given below is based on three conditions; namely

1. That the client have adequate space and housing for raising 300 turkeys; that the building in which they are to be housed needs only minor repairs; that there is sufficient scrap lumber, poles, and materials about the place to construct range equipment and roosts; and that the client has the skill and ability to make the necessary improvements himself.
2. That the client purchase 300 one-day old poultts of the large type, to be started the last of May, and marketed the last of November (about 24 weeks) as roasters.
3. That  $\frac{3}{4}$  of the feed consumed must be purchased.

Example: Any space containing approximately 200 square feet that can be kept warm; free from rodents; dry; well ventilated and free from drafts and providing some sunlight, will accommodate 150 poultts during the brooding period of 8 weeks. Three hundred

Raising Turkeys on the Range (Contd.)

poults would require two brooder houses, each consisting of 200 square feet of floor space. Additional space, separate from the brooder house and rodent-proof, should be available for storing feed.

According to information obtained from county agricultural agents in different parts of the country, lamp heated brooders are inexpensive, efficient, and adequate. A heating device that will take care of 150 poults is estimated to cost approximately \$10 (exclusive of labor), including minor electrical installations and heating bulbs. Two lamp heated brooders would be required for 300 poults—a cost of \$20.

Feeders and waterers can be made for brooder houses, or purchased for a very small sum, approximately \$10. Sanitary feeders and waterers to accommodate 150 growing turkeys can also be built at a good saving, or purchased for about \$25—\$50 for 300 turkeys.

According to information obtained from county agricultural agents and hatcheries, day-old turkeys of the large type, from strains having disease free records, can usually be purchased for 75 cents each, or \$225 for 300 poults.

Reliable data shows that large type turkeys raised on the range to market age of 24 weeks require 3 to  $4\frac{1}{2}$  pounds of mash and grain, in addition to forage, to produce one pound of meat; that the average cost of feed (mash and grain) in 1953 was \$5.50 per hundred weight; that the cost of electric heat and medicine (during the brooding period of 8 weeks) is approximately  $1\frac{1}{2}$  cent per pound of turkey meat; and that successful growers raise approximately 90 percent of their turkeys to market age. Using these figures as a basis and taking 3.3 pounds as the amount of mash and grain required to produce one pound of the large type turkey to a market age of 24 weeks, it would cost  $18\frac{2}{3}$  cents to produce one pound of large type turkey meat.

Consider that 270 turkeys (after deducting 10 percent of 300 for mortality) averaging 17 pounds each, at 24 weeks, were sold as roasters, the cost of feed, heat, medicine, and poults (300 at 75 cents each) would be \$1,080.90.

The items of cost for establishing a training program as described in this example are as follows: Feeders and waterers for brooders, \$20; heat lamps and wiring, \$20; materials for building feeders and waterers for growing turkeys, \$50; 300 poults at 75 cents each, \$225; feed, heat, and medicine for 270 large type poults raised to market age, \$858.60. Total cost of project, \$1,173.60.

Raising Turkeys on the Range (Contd.)

The net return from the sale of 270 17-pound large type turkeys (4,590 pounds) at the 1953 live weight market price of 34 cents per pound is \$1,560.60, less the total cost of \$1,173.60, would be \$387.

The net return from the sale of 270 17-pound large type turkeys, \$387, less the cost of equipment purchased for the project, \$90, would be \$297.

In training projects conducted in areas of the country where the operator can raise his own grains, the cost will be cut materially from that given in the example.

**REMARKS**

The above information was obtained from a personal interview with Mr. VaNon Dahle, a totally blind man and his sighted wife, who were engaged in the raising of turkeys on the range near Clarkston, Utah; the text "Turkey Management" by Marsden and Martin; "Starting Right with Turkeys" by G. T. Klein; Farmers' Bulletin No. 1409 titled "Turkey Raising" and Farmers' Bulletin No. 1652, "Diseases and Parasites of Poultry," published by the U. S. Department of Agriculture, Washington, D. C.; and from consultation with two county agricultural agents who have observed and worked with successful poultry raisers who are blind.

Authorities agree on all of the important phases of the industry, and persons contemplating the raising of turkeys should avail themselves of the information derived through research and the experience acquired by persons engaged in the business.

Irrespective of sight, growers should, at the first sign of disease in the flock, consult the county agricultural agent for advice, obtain the services of a veterinarian to diagnose disease and administer treatment. (See section on Diseases, Pests, and Common Ailment, page 66); take advantage of current information developed on scientific methods of feeding, care, and management; and attend schools conducted by the National Turkey Improvement Plan for training growers in methods of selecting turkeys for marketing and grading dressed turkeys.

All of the operations involved in the raising of turkeys have been observed and analyzed by a totally blind staff member in Services for the Blind; and it has been determined that many of the operations involved in the daily work of raising turkeys on the range require full use of sight. It, however, does not mean that a blind or visually impaired person with sighted assistance cannot be successful raising turkeys by this method. Mr. VaNon Dahle, a totally blind man who, with the assistance of his sighted wife, raises turkeys on the range near



Raising Turkeys on the Range (Contd.)

Clarkston, Utah, has demonstrated that the management of the business and about 75 percent of the work can be performed successfully and profitably without sight. Blind persons possessing the skills to successfully care for turkeys will usually have imagination and ingenuity sufficient to solve problems as they arise, such as purchasing a Braille thermometer for controlling temperature.

The raising of turkeys provides five distinct possibilities; namely, an opportunity for:

1. Families of small means and with limited space who, by raising their own meat, will reduce their living costs.
2. Operators of general farms or projects of a mixed nature who want to increase their number of activities to supplement their sources of income.
3. Growers wishing to engage in a project for the exclusive purpose of marketing live and dressed turkeys to the wholesale and retail trade.
4. Persons desiring to establish a business selling dressed turkeys, with or without stuffing; in halves; or cut-up and sold by the piece direct to the consumer.
5. Persons having access to a large acreage of grazing land with an abundance of grasshoppers, and grain or rice fields, which could be leased for turkey range after harvest time.

Before deciding to engage in a project of a commercial nature, blind persons should make certain that:

1. There is a dependable market.
2. They have selected a variety which is best suited for the type of customers to be served.
3. There is a reliable source from which to purchase hatching eggs and poults having a disease-free record.
4. They possess a working knowledge of the business acquired through experience or training.
5. They are familiar with the services of the National Turkey Improvement Plan; Turkey Growers Association; the State and Federal Experiment Farms; and the U. S. Department of Agriculture.

Raising Turkeys on the Range (Contd.)

6. They are familiar with the services provided farmers by the various County, State, and Federal agencies.
7. They have sighted assistance that is dependable, such as a wife or other member of the family; partner; or hired help; to advise regarding condition of the flock and premises, and to perform the jobs which require sight.

## IV. JOB SPECIFICATIONS

Tasks Performed

The operator obtains the various types of feed, including the concentrates and succulents, from source of supply, and stores it in a feed room or building adjacent to the turkey house. He measures and weighs the feed and places it in the feeder. He sterilizes and fills the water containers. The brooders, rearing pens, and equipment are kept clean, sanitary, and in good repair. On the range he fills the feeders and waterers; keeps them clean and sanitary; keeps feeding corral and range shelter clean and free from contamination; maintains repairs and constructs equipment; and assists sighted persons with the operations involved in moving equipment, establishing camp, and erecting corrals for feeding and protection from thieves, animals, and weather. He must constantly watch and inform his co-worker of any sign of approaching disease or other trouble. He keeps simple records of his expenses and income. He must constantly watch for the first sign of disease. He sells his stock by contacting his customers by letter, phone, or in person.

## V. REQUIREMENTS

Physical: Active age; standing and walking most of the time. Bending is required to care for turkeys and repair buildings and equipment.

Feet: Ability to walk, stand, and stoop.

Hands: The use of both hands.

Thumbs: The use of one or both.

Fingers: Index, middle, and ring finger on one hand or both.

Vision: Vision is required for herding, driving, caring for and overseeing flock on the range, and for moving equipment from place to place. No vision required during the brooding period, or for maintaining, repairing and constructing fences and equipment; or providing management services.

Hearing: When the worker is blind, good hearing is required.

Raising Turkeys on the Range (Contd.)

Mental: Alertness, good memory, coordination, and ordinary pace.

Educational: Understanding of the English language; ability to read and write is important, but this service could be supplied by a member of the family or a reader may be hired.

Physical Environment: Usually in small or medium-sized buildings during the brooding period (feed house, brooder house, and rearing shed); works in the open (in small fields or on the open range), noisy; works alone or with sighted help as required when feeding or watering turkeys; cleaning equipment and shelters; maintaining or constructing equipment; works with sighted help in performing all duties involved in caring for the flock on the range.



Raising Turkeys (Contd.)

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FEDERAL SECURITY AGENCY  
Office of Vocational Rehabilitation  
Washington 25, D. C.

May 15, 1949

REHABILITATION SERVICE SERIES NUMBER 58 - SUPPLEMENT 5

To : Divisions of Vocational Rehabilitation (in States with no separate Agency for the Blind); Commissions and Other Agencies for the Blind.

Subject: Supplement to Handbook of Representative Industrial Jobs for Blind Workers - Category SI-6, Foundries.

The attached material on the Foundry industry is to be inserted in the Handbook of Representative Industrial Jobs for Blind Workers as the fifth category in Part I, Specific Industry Series. It describes a few of the jobs in this industry and is not intended to be all inclusive of all possibilities for blind workers. Like the jobs described in the first issue, those in this category have been observed and tested by a blind member of the staff of the Section of Services for the Blind.

Other categories of job specifications are being prepared and will be forwarded to you at an early date. Additional copies of the Handbook or any of its supplements will be furnished upon request. We trust that this material will be helpful and would appreciate any suggestions for improvement which you might have to offer.

Donald H. Dabelstein  
ASSISTANT DIRECTOR

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HANDBOOK OF  
REPRESENTATIVE INDUSTRIAL JOBS FOR BLIND WORKERS

SPECIFIC INDUSTRY SERIES

Category SI-6

FOUNDRIES

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The above list only partially represents the employment opportunities for blind persons in this category and specifications for others will be issued as circumstances permit. Additional jobs such as the following should be sought, and all jobs must be carefully analyzed for suitability under the conditions found in a particular plant;

Operating a Core Blower Machine

Operating a Turn Over Draw Machine

Shaping Out Castings

Various Types of Laboring Jobs





HANDBOOK OF  
REPRESENTATIVE INDUSTRIAL JOBS FOR BLIND WORKERS

SPECIFIC INDUSTRY SERIES

FOUNDRIES

General Information Sheet

Character of the Industry: Foundries comprise that branch of the metal working industry which produces castings -- that is, metal objects shaped by pouring molten metal into molds and allowing the metal to solidify. This process is highly diversified. It serves as an economical means of forming a wide range of intricate shapes possessing considerable strength and rigidity and varying in size from several ounces to many tons. Castings are therefore used extensively as the component parts of a large variety of metal products. Although some finished articles are cast, the bulk of the castings output flows into the metal fabricating industry to serve as integral parts of the final product. Illustrations of the many applications of castings are automotive cylinder blocks, farm machinery gears, bearings, valve bodies, machine tool beds, ingot molds, water mains, bath tubs, radiators, washing machine parts, kitchen utensils and radio parts.

Casting is applicable to a number of basic metals and their alloys. They are classified into four broad groups-- cast iron, steel, malleable iron, and the non-ferrous alloys. Cast iron is a technical term embracing gray, white, mottled and chilled iron, among which gray iron is quantitatively the most important. Cast steel includes carbon and alloy steel, which is further classified according to its carbon and alloy content. Malleable iron is an originally brittle "white iron" converted by a heat treating cycle into the malleable product. The non-ferrous alloys are sub-divided according to their dominant elements -- copper, aluminum, magnesium, lead, zinc, tin and nickel.

The tendency toward specialization and the use of production methods for casting one or two metals gives rise to several fairly distinctive classes of foundries. The kinds of metals used in a single establishment depend largely on the type of melting equipment and the training and experience of the workers in the plant. However,

## FOUNDRIES

General Information Sheet (Cont'd)

foundries often operate separate departments in order to cast two or more types of metals; thus many ferrous foundries have non-ferrous departments. In any consideration of foundries the distinction between jobbing and production methods of casting is fundamental. In production type operations large numbers of castings are made from each design, and machine methods are employed to a substantial extent. In jobbing operations very limited numbers of castings, frequently only one or two, are made of each design and hand methods predominate. Intermediate between the two is the semi-production type of operation. Production foundries typically serve mass production industries which use large quantities of identical castings as components of standardized final products such as automobiles, plumbing and heating equipment, and household appliances. Jobbing foundries provide castings for incorporation into limited quantity products such as machine tools and special purpose machinery of various types. In practice, the distinction between production and jobbing foundries is partially blurred by the fact that production foundries often do some jobbing work, especially in slack seasons.

Foundry operations may be carried on either as separate enterprises or as part of broader manufacturing projects. Independent or commercial foundries specialize in castings, selling their output to other plants for incorporation in their product. Captive or integrated foundries are departments or subsidiaries of a parent company to which they transfer their output of castings for final assembly.

The production of gray iron castings is greater than the combined total of all other types. Next in order in total weight of castings produced are steel, malleable iron and non-ferrous metal castings. Among the ferrous metal foundries, gray iron foundries are typically small production units, the majority employing less than 50 factory workers and only a very few employing more than 250 such workers. Both steel and malleable iron foundries are somewhat larger than the typical gray iron foundry, more than half employing over 250 wage earners, with a few employing as many as

## PART I

## FOUNDRIES

General Information Sheet (Cont'd)

4,000, and practically none having a payroll of less than 50. Non-ferrous metal foundries are usually quite small, the majority employing less than 25 workers and practically none with a production force of more than 200.

Distribution of the Industry: Because foundries produce parts for other metal working industries they are located in every section of the country where metal working activity is significant. The concentration is in the principal industrial areas of the country - California, Ohio, Illinois and Pennsylvania.

Type of Workers Usually Employed: Of the estimated 425,000 (Source: "Employment Outlook in Foundry Occupations, Bulletin No. 880, United States Department of Labor, Bureau of Labor Statistics) production workers employed in foundries in 1944, over 1/4 might be classed as skilled. Most of these skilled jobs, as well as many of the less skilled ones, are peculiar to foundry processes, molding and core making in particular. The foundry occupations are mainly limited to the employment of men, reflecting the strenuous nature of much of the work as well as traditional practices. A very small percentage, probably one or two per cent, of the workers are women who are primarily employed as small core makers in production foundries. The proportion of negro employees is markedly high. They are not only employed in unskilled and semi-skilled jobs but also to a substantial extent as skilled molders and core makers. Wages in this industry compare favorably with those in the basic metal working industries generally.

Pattern making, molding and core making are considered to be highly skilled jobs and require an average of approximately four years apprenticeship or equivalent training. An apprentice or helper may perform many of the duties of a journeyman and it is with this in mind that the job description of core making is included in this category as a suggested employment opportunity for a blind person. Jobs in the finishing department do not usually require status, although they may be considered as a part of a journeyman's training. Since Union contracts are the rule in foundries, it will be necessary for the employ-



## FOUNDRIES

General Information Sheet (Cont'd)

ment counselor to establish a working relationship with these unions if he hopes to secure favorable consideration of a blind person for a job in this industry.

Working Conditions: The working environment varies greatly among individual foundries. Some compare favorably with metal working operations as a whole in such respects as frequency and severity of accidents, incidence of industrial diseases, plant cleanliness, ventilation and temperature. Others fall far below average for safety and comfort. Because of this wide range, generalization on foundry working conditions are likely to be somewhat misleading. However, with this limitation in view, the following information may be helpful: Smoke and fumes are often a nuisance in foundries; however, where adequate ventilating systems have been installed, discomfort from these sources has been minimized. Heat may be excessive near the melting units, especially in summer, and inadequate in other operations of the establishment during the winter. However, better regulation of temperature has been achieved through the installation of air-conditioning equipment. Noise may be a problem especially in the furnace cleaning and finishing rooms. Personal cleanliness in foundry work is difficult because of the extensive use of sand in the casting process. However, good housekeeping has in many cases kept this situation under control. In addition a large number of foundries now provide showers for their employees.

Safety Precautions, Health Conditions, Hazards: Hand movement of heavy material is a major source of foundry accidents resulting in strains or crushed fingers or toes. Objects dropped from overhead cranes are responsible for some of the more serious accidents; spilled or splashed molten metals may endanger many workers on the foundry floor. Since much of the work is done on the floor, falls may result from tripping over tools, scrap metal and other objects left lying about. In general pattern shops and core rooms, where the work is principally done on benches, are the least hazardous departments. Molding departments are somewhat more hazardous, and shake-out, mold cleaning, and finishing operations show the highest injury rates. Hazards associated with foundry work are to a large degree preventable by such means as good

## FOUNDRIES

General Information Sheet (Cont'd)

housekeeping (the orderly arrangement of materials and tools), providing special safety equipment for certain operations, furnishing machinery for heavy lifting, and training the workers in safe practices. Foundry workers may be exposed to the danger of silicosis which in some cases may lead to tuberculosis and pneumonia. However, the incidence of silicosis is actually quite low, and it is a relatively minor source of disability. The danger of silicosis may to a large extent be eliminated by the installation of dust control equipment. In recent years substantial progress has been made in this respect.

General Coverage Jobs Pertinent: Many jobbing foundries pack their castings in wooden boxes or crates for shipment. This operation will be described under Wrapping and Packaging GC-2.

Combination Employment:

- A. Core maker, core cleaner, core maker machine.
- B. Rough grinder, deburrer.

Jobs Usually to be Avoided Although Seemingly Suitable: Chipper, sand conditioner, sand cutter, shake-out man.

## FOUNDRIES

BENCH CORE MAKER

1. Name Used for Position in Plant Surveyed: Bench Core Maker

D.O.T. Title: Core Maker (bench)

Code: 4-82.010

Alternate Titles: None

D.O.T. Definition: A core maker (1) who makes small and size cores, used in molds to form hollows or holes in metal castings, on a work bench.

Items Worked on in Plant Surveyed: Small cores used in molds for casting the flange end of soil pipe.

2. Usual Operator:

a. Sex: Male

b. General Characteristics: Any size, nimble, careful, average mental ability, negro workers often employed.

3. Physical Demands:

a. Activities: Walking, standing, turning, reaching, lifting, carrying, handling, fingering, feeling, talking, hearing.

b. Working Conditions: Inside, dusty, dirty, odors, noisy, adequate lighting and ventilation, works around others.

c. Skill Required: Skilled. Ability to judge texture and contour tactually, to exercise a high degree of muscle control especially of the hands and arms, and to locate small objects within arms' reach quickly and accurately.

4. Details of Physical Activities: Stands all day; may walk a distance of from ten to twenty feet to place cores in oven; reaches toward back of bench to secure core sand. Lifts core plate weighing up to five pounds; turns to



## FOUNDRIES

BENCH CORE MAKER (Cont'd)

place it on storage shelf at right. Handles, fingers and feels sand, core box, mallet and scraper to make the core. Talks with and listens to others to exchange necessary information.

5. Details of Working Conditions: Works with others, inside in adequately lighted and ventilated room. Air may contain an excessive amount of dust because of screening, mixing, and packing sand. Work is dirty because of the handling of core sand. Noisy, due to the operation of nearby machinery and oven.
6. Hazards: There are no particular hazards connected with this position unless the worker is required to place his cores in the oven. In this event, he must exercise extreme care in order to prevent minor burns which may result from touching the shelves inside the oven on which the cores are placed.
7. Sequence of Steps in Position in Plant Surveyed:  
  
Worker:
  - a. Secures a core drying plate from box at left (plates are supplied by another worker) and slides it onto the bench in front of him.
  - b. Slides a core box onto the drying plate thus cleaning any excess sand from the plate.
  - c. Cleans the inside of the core box by wiping it with a kerosene-saturated cloth.
  - d. Sprinkles talcum into core to prevent the damp core sand from sticking to it.
  - e. Using both hands, partially fills the core box with core sand which has been placed on the far side of the work table by another worker.
  - f. Using a hand rammer, packs sand tightly into core box. (The experience and judgment of the worker is required

ADDITIONAL JOBS LISTED IN PART II, GENERAL COVERAGE SERIES.

## FOUNDRIES

BENCH CORE MAKER (Cont'd)

to tell when the sand is packed tightly enough. If the sand is packed too tightly, it will prevent the escape of gasses in the metal during cooling and cause blow holes in the casting. If the sand is packed too loosely, the result will be that the casting's surfaces will be pitted with sand particles).

- g. Completely fills the remainder of the core box with sand and tamps it down tightly with a hand rammer. (Here, again, judgment must be used to determine when the sand is packed tightly enough).
- h. Smoothes the top of the core and removes surplus sand with a straight edge.
- i. Using a straight wire, pierces the core several times to permit the escape of gases when the casting is poured. (The number of vent holes is determined by the size of the core). Taps the core box gently with a hammer to loosen it from the core.
- j. Using both hands, "parts" the core box, making certain that both hands are pulled straight away from the core).
- k. Places the core plate and core on a rack at his right for removal to the oven by another worker, where it is baked and hardened.

NOTE: In some plants this worker is required to carry his cores to the oven, in which case the Employment Counselor will have to consider the distance to be travelled and the type of oven used before determining the type and amount of vision the worker should possess. Although it is not recommended, totally blind persons have been known to load their cores into the oven.

8. Equipment as Found in the Particular Plant Surveyed:

- a. Identification: Work bench, core box, hammer, hand rammer, straight edge, used as a scraper vent wire and storage shelves.
- b. Set-up and Maintenance: None
- c. Modification: None

ADDITIONAL JOBS LISTED IN PART II, GENERAL COVERAGE SERIES.

## FOUNDRIES

BENCH CORE MAKER (Cont'd)9. Equipment Variations Which May be Found in Other Plants:

Substantially the same in all plants. In production factories the cores may be removed by a conveyor belt.

10. Usual Pre-employment Training: Workers are frequently chosen from the foundry's labor force which has had some experience in handling sand and finished cores. In addition, credit for training received at a vocational school is sometimes given.11. Usual Training Procedure on the Job: Basic instruction is generally given by an experienced core maker who reduces the amount of his supervision as the new employee becomes more familiar with the tasks involved.12. Any Training Deviations Suggested for the Blind: None13. Production:

a. Full: Not established because of the variation in the size of the cores and the intricacy of their contours. In the plant surveyed, the worker produced 25 of the above described cores per hour.

b. Time to Reach Normal Efficiency: One to three months.

14. Interrelation with Preceding and Succeeding Jobs: None15. Teaming with Other Workers: None16. Modification, Deviation, Special Tools for the Blind: When placing a blind person on this job, the Employment Counselor will probably have to make arrangements with the company and the union for that person to be hired as an apprentice or a core maker helper. In any event, there should be a complete understanding between all parties concerned.

ADDITIONAL JOBS LISTED IN PART II, GENERAL COVERAGE SERIES.



## FOUNDRIES

BENCH CORE MAKER (Cont'd)17. Sight Requirements and Conditions:

- a. Vision Required for the Job: None
- b. Conditions affecting Suitability of a Particular Job:
  - 1. For the Totally Blind: No inspection of finished cores and no requirements of the worker to place cores in oven.
  - 2. For the Partially Sighted: Travel and inspection requirements as well as heat and dust conditions must be compatible with the worker's type and amount of vision.

18. Avoid the Following Conditions: Transfer to other jobs which have not been approved as suitable for performance without the use of sight.19. Other Jobs Often Combined for Full-Time Employment: Core cleaner, core machine operator.20. Industries, Parts of Industries, or Types of Plants Where This Type of Job is Frequently Found:

Production and semi-production types of foundries which cast ferrous and non-ferrous metals.

## FOUNDRIES

CORE CLEANER

1. Name Used for Position in Plant Surveyed: Core Cleaner

D.O.T. Title: Core Cleaner

Code: 8.82.10

Alternate Titles: Core filer, core scraper.

D.O.T. Definition: Core Cleaner II (foundry) Core filer; core scraper. Grinds or files high spots, feather edges, or fins from baked cores; uses hand and power tools, such as files, scrapers, abrasive stones, and grinding wheels. A task performed by a Coremaker Helper.

Items Worked on in Plant Surveyed: Small baked cores.

2. Usual Operator:

a. Sex: Male

b. General Characteristics: Any size; numble; quick arm and hand movements; average mental ability; negro workers frequently employed.

3. Physical Demands:

a. Activities: Standing, reaching, lifting, handling, fingering, feeling.

b. Working Conditions: Inside; adequate lighting and ventilation; works around others.

c. Skill Required: Ability to differentiate between smooth and rough surfaces tactually; sufficient muscular control to manipulate file and emery paper to remove excess material without injuring adjacent surfaces, and to locate items within arm's reach quickly and accurately.

ADDITIONAL JOBS LISTED IN PART II, GENERAL COVERAGE SERIES.

## FOUNDRIES

CORE CLEANER (Cont'd)

4. Details of Physical Activities: Stands all day and works rapidly with hands and arms; reaches three or four feet ahead and to right or left; lifts tray of cores weighing up to fifteen pounds; handles, fingers and feels cores to detect fins, high spots and rough surfaces.
5. Details of Working Conditions: Works around others, inside, in adequately lighted and ventilated room.
6. Hazards: None
7. Sequence of Steps in Position in Plant Surveyed:

Worker:

- a. Lifts a tray of cores brought to him by another worker from the far side of his bench and places it in a convenient position in front of him.
  - b. Takes the baked cores from the tray, one by one, and using a file, emery stone and/or sandpaper, removes fins and high spots, smooths rough surfaces and returns the core to its place on the tray.
  - c. When all the cores have been completed, lifts tray and sets it on far left side of work bench for removal by another worker.
8. Equipment as Found in the Particular Plant Surveyed:
    - a. Identification: File, emery stone, sandpaper and work bench.
    - b. Set-up and Maintenance: None
    - c. Modification: None
  9. Equipment Variations Which May be Found in Other Plants:

Substantially the same in all plants except that conveyor belts may be used to remove trays of cleaned cores.

10. Usual Training Procedure on the Job: Supervisor instructs new worker in all steps of the operation.

ADDITIONAL JOBS LISTED IN PART II, GENERAL COVERAGE SERIES.



## FOUNDRIES

CORE CLEANER (Cont'd)

11. Usual Training Procedure on the Job: Supervisor instructs new worker in all steps of the operation.
12. Any Training Deviations for the Blind: None
13. Production:
  - a. Full: Not established because of the wide variety of sizes and the difference in the intricacy of the cores.
  - b. Time to Reach Normal Efficiency: Two weeks to two months depending upon the intricacy of the design of the cores.
14. Interrelation with Preceding and Succeeding Jobs: None
15. Teaming with Other Workers: None
16. Modification, Deviation, Special Tools for the Blind: None
17. Sight Requirements and Conditions:
  - a. Vision Required for the Job: None
  - b. Conditions affecting Suitability of a Particular Job:
    1. For the Totally Blind: No travel outside the work area to secure or dispose of materials and no inspection or repair requirements.
    2. For the Partially Sighted: Travel and inspection requirements must be compatible with the type and amount of the worker's vision.
18. Avoid the Following Conditions: Transfer to other jobs which have not been approved as suitable for performance without the use of sight.
19. Other Jobs Often Combined for Full-Time Employment: Small core maker; core machine operator.

FOUNDRIES

CORE CLEANER (Cont'd)

20. Industries, Parts of Industries, or Types of Plants Where  
This Type of Job is Frequently Found:

Production foundries, or jobbing foundries of a production or semi-production nature.

## FOUNDRIES

ROUGH GRINDER

## 1. Name Used for Position in Plant Surveyed: Rough Grinder

D.O.T. Title: Bench Grinder (any industry)Code: 6-77.710Alternate Titles: Emery wheel worker; finish grinder; grinding-lathe operator; off-hand grinder; rough-grinder; rough grinder, hand.

D.O.T. Definition: Cleans and rough-finishes the surfaces of metal objects by holding them against the rotating abrasive wheel of a grinding lathe which is little more than a motor-driven horizontal axle on which one or more abrasive wheels are mounted: turns on electric motor to start machine; lifts object to be ground and rests it against a small shelf or rest adjacent to wheel; presses work against wheel, turning it about with hands to accomplish the desired grinding.

Items Worked on in Plant Surveyed: Small castings2. Usual Operator:a. Sex: Maleb. General Characteristics: Any size, cautious, average mental ability, negro workers frequently employed.3. Physical Demands:a. Activities: Standing, turning, lifting, reaching, pushing, pulling, handling, fingering, feeling.b. Working Conditions: Inside, dusty, noisy, adequate lighting and ventilation, mechanical hazards, works around others.c. Skill Required: Semi-skilled. Ability to: judge the intensity and direction of light currents of air; accurately judge distance and direction of his hand and arm movements from a fixed working position: tactually differentiate between rough and smooth surfaces; feel rough, sharp areas of metal without



## FOUNDRIES

ROUGH GRINDER (Cont'd)

cutting his fingers; exercise muscular control, especially of the hands and arms; locate items within arm's reach quickly and accurately; and judge amount of pressure to exert against a cutting wheel.

4. Details of Physical Activities: Stands all day and works with hands and arms; turns to secure and dispose of material; reaches up to three feet to lift material weighing up to five pounds; handles, pushes and pulls pieces to bring them into contact with the abrasive grinding wheel; fingers and feels pieces to determine where grinding is necessary and when work has been completed.
5. Details of Working Conditions: Works around others, inside, in adequately lighted and ventilated area which is dusty because of metal particles thrown from the grinding wheel and noisy because of the operation of the grinder and other nearby machinery.
6. Hazards: The worker might receive serious lacerations of the hands, fingers or forearm from the rotating grinding wheel. This hazard will be substantially reduced if the worker will observe ordinary safety precautions, judge the position of the grinding wheel and the proximity of his hands to it by the current of air it throws off, use the rest plate as a guide, and always keep his work between his fingers and the wheel.
7. Sequence of Steps in Position in Plant Surveyed:  
Worker:
  - a. Obtains a casting from truck at right, which has been put in place by another worker.
  - b. Using both hands, determines what rough spots need to be ground off. (Sighted workers would make this determination visually).
  - c. Holding the piece with both hands and using the rest table to support the piece, as well as for locating position, pushes the part to be ground against the rotating wheel.

## FOUNDRIES

## ROUGH GRINDER (Cont'd)

- d. Follows around the piece, exerting the necessary pressure against the wheel, until the rough grinding has been completed.
- e. After examining it tactually to make sure that he has completed his grinding, places piece on truck at left for removal by another worker. (Sighted workers make this determination visually).

8. Equipment as Found in the Particular Plant Surveyed:

- a. Identification: Double end bench grinder with small material rest and material trucks.
- b. Set-up and Maintenance: Provided by maintenance man.
- c. Modification: None

9. Equipment Variations Which May be Found in Other Plants:

Substantially the same in all plants. May have work table surrounding the wheel; may or may not have hoods to protect eyes from dust or chips thrown from the wheel.

- 10. Usual Pre-employment Training: None. Previous factory experience is helpful.

- 11. Usual Training Procedure on the Job: Supervisor instructs worker in all steps of the operation.

- 12. Any Training Deviations Suggested for the Blind: No training deviations for the blind worker with former machine work experience. When workers are inexperienced in operating power equipment, they should have three or four weeks' training such as is given in a vocational school. The employment counselor should plan the content of the training and take such steps as are necessary to insure its effectiveness. This will give him confidence, a working knowledge of and familiarization with machinery, machine noises, proper safety procedures, and tends to make him a desirable employee.

## FOUNDRIES

ROUGH GRINDER (Cont'd)

13. Production:
- a. Full: Not established because of variation in the size of pieces.
  - b. Time to Reach Normal Efficiency: Approximately four weeks.
14. Interrelation with Preceding and Succeeding Jobs: Not significant.
15. Teaming with Other Workers: None
16. Modification, Deviation, Special Tools for the Blind: None
17. Sight Requirements and Conditions:
- a. Vision Required for the Job: None
  - b. Conditions affecting Suitability of a Particular Job:
    - 1. For the Totally Blind: No travel to secure and dispose of material.
    - 2. For the Partially Sighted: Sight and travel requirements, as well as dust conditions and the degree of lifting, must be compatible with the type and amount of vision and eye condition of the worker.
18. Avoid the Following Conditions: Transfer to other jobs which have not been approved as suitable for performance without the use of sight.
19. Other Jobs Often Combined for Full Time Employment: Packing castings for shipment.
20. Industries, Parts of Industries or Types of Jobs Where This Type of Job is Frequently Found:
- Any foundry - especially gray and malleable iron.

ADDITIONAL JOBS LISTED IN PART II, GENERAL COVERAGE SERIES.



FEDERAL SECURITY AGENCY  
Office of Vocational Rehabilitation  
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To : Divisions of Vocational Rehabilitation (in States with no separate Agency for the Blind); Commissions and Other Agencies for the Blind.

Subject: Supplement to Handbook of Representative Industrial Jobs for Blind Workers - Category GC-2, Wrapping and Packaging.

The attached material on the Wrapping and Packaging category is to be inserted in the Handbook of Representative Industrial Jobs for Blind Workers as the second category in Part II, General Coverage Series. It describes a few of the jobs in this category and is not intended to be all inclusive of all possibilities for blind workers. Like the jobs described in the first issue, those in this category have been observed and tested by a blind member of the staff of the Section of Services for the Blind.

Other categories of job specifications are being prepared and will be forwarded to you at an early date. Additional copies of the Handbook or any of its supplements will be furnished upon request. We trust that this material will be helpful and would appreciate any suggestions for improvement which you might have to offer.

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ASSISTANT DIRECTOR

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HANDBOOK OF  
REPRESENTATIVE INDUSTRIAL JOBS FOR BLIND WORKERS

GENERAL COVERAGE SERIES

Category GC-2

WRAPPING AND PACKAGING

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The above list only partially represents the employment opportunities for blind persons in this category and specifications for others will be issued as circumstances permit. Additional jobs such as the following should be sought and all jobs must be carefully analyzed for suitability under the conditions found in a particular plant:

Estimating Weights (bulk items up to two pounds)  
Packing Small Packages into Large Containers  
Wrapping Unit Lot Packages  
Wrapping Bolts of Cloth  
Crating Medium and Small Items (machinery, stoves, etc.)  
Packing Fruit and Vegetables (following grader and sizer)  
Bundle Tying





HANDBOOK OF  
REPRESENTATIVE INDUSTRIAL JOBS FOR BLIND WORKERS

GENERAL COVERAGE SERIES

WRAPPING AND PACKAGING

General Information Sheet

D.O.T. Alternate Titles:

- a. Wrapper (I) (Any industry) binder; bundle wrapper; bundler; package wrapper; packer; paper hand; paperer.
- b. Crater (III) (any industry) boxer. A Box Maker, Wood III.
- c. Packer (any industry) (I) Filling Machine Operator (I); bagger; packer; packer machine operator; packer man; packing-machine operator; sack filler; sacker; sealer-packer; spout filler; spout puller.

Description of Job Category: In general this category deals with the preparation of finished items, small or medium size, for shipment to the customer bundled or in a container. It includes wrapping one or more items in materials such as paper, cellophane, or padding; placing one or more articles into a container such as an envelope, carton, box, crate, tube or jar; tying a number of items into a bundle with or without additional covering. These jobs may include setting up or assembling the carton, box or crate. Jobs in this category are essentially hand operations.

D.O.T. Definitions for:

- a. Wrapper I (any industry) A Laborer. Wraps packages or finished products of an establishment, making a neat, durable bundle; secures package with twine, ribbon, gummed tape, or paste. May currently inspect articles before wrapping for defect, size, color, number, or other items. May segregate articles according to size or type, or according to customers' orders.

## WRAPPING AND PACKAGING

General Information Sheet (Cont'd)

- b. Crater III (any industry) boxer. A Box Maker, Wood III who builds wooden boxes or crates and packs finished products in the completed box or crate, reference, Packer III. May wrap and pad the products with excelsior or other packing material. May build crate around the objects of odd shapes. May be specifically designated according to product crated, as Machinery Crater; Refrigerator Crater.
- c. Packer (any industry) (I) Filling Machine Operator (I) (any industry). Fills sacks or bags, or other containers with loose material, such as flour, sugar, or cement, using a machine that automatically fills the container with the desired weight of material; encircles filling spout of machine with neck of container; (1) trips a lever causing material to flow into spout until scale mechanism in spout automatically stops flow of material and then pulls a slide in lower end of spout to drop material into container, or (2) pulls a slide in spout to cause material to flow directly into container until scale platform on which container rests automatically actuates a mechanism stopping flow of material; places filled container aside for removal or places it on a conveyor; periodically checks accuracy of weighing mechanism by weighing a filled container on a test scale. May adjust weighing mechanism and keep such records as the number or weights of containers filled. This category also includes packing of liquids.

Characteristics of Usual Worker: Women and girls are employed in packaging small and light weight articles (weighing up to approximately 10 lbs.) If heavy weights are to be lifted, or medium weights are to be handled rapidly, entailing considerable physical exertion, men or boys are employed. Wherever rapid, dexterous handling is required, younger persons are usually preferred. Workers are the type suited for light physical work and accustomed to medium or low wages.

Physical Requirements, Aptitudes, and Abilities: These jobs require good orientation and dexterity both in finger and arm movements. A good sense of tactual perception may be necessary where inspection is required. Often the worker must maintain a constant, rapid pace for



## WRAPPING AND PACKAGING

General Information Sheet (Cont'd)

for significant periods of time, requiring considerable physical and nervous energy. Handling heavy boxes and cartons may require considerable physical strength and ability to lift properly. In some cases the worker must have ability to count and keep track of quantities of articles to be packed together.

Training and Preparation Procedures: The worker is given primary instruction by the Supervisor on the job and allowed practice time, from one day to several weeks, depending on the nature of the job, before being expected to reach normal efficiency. A worker entirely new to Wrapping and Packaging may be started on a comparatively simple type of work detached from a production line and later advanced to more complicated positions. When an experienced worker has developed a special technique it may be beneficially taught the new worker.

Safety Precautions, Health Conditions, Hazards: Operations in this category present no hazards except where the job includes machine operation such as for filling, tying, or wrapping. Safety conditions will vary widely. Each position must be carefully analyzed before being pronounced suitable for a blind worker. In some jobs, the worker's hands must become toughened against the wear and small cuts from the articles or cartons being handled. Taping fingers, wearing gloves or wrist cuffs may be necessary. Where heavy items are being handled, the worker must be careful to lift and set down properly to avoid straining, or bruising of fingers and toes. Health conditions will vary according to the industry but are usually good. Jobs in this category are generally found in the cleaner, healthier parts of the plant. Packaging powdered materials may subject the worker to dusty conditions.

Industries Where This Category is Frequently Found: Jobs in this category are found in almost any industry making small or medium sized articles. Packaging small finished articles, components or accessories often includes counting operations. Packaging in wooden crates is frequently found in plants making such items as stoves, machinery and furniture. Jobs will be found in plants making loose items such as cement, powdered paints, sugar and flour; metal, wooden and plastic articles; food stuffs; drugs and sundries, and service industries. It is intended to describe here jobs in which

## WRAPPING AND PACKAGING

General Information Sheet (Cont'd)

the action, type of equipment used and other conditions are similar in many industries, and where experience in one industry may qualify the worker for employment in another. Therefore, when surveying any plants they should be carefully checked for jobs in this category.

Jobs Usually to be Avoided Although Seemingly Suitable:

Packing positions where visual inspection is included must be avoided for a blind worker. Where color determination is the only visual job requirement, some types of partial sight may be adequate. All positions must be carefully checked for the selection and securing of materials and products. Operations involving the application of glue and other adhesives with a brush, must often be avoided for a totally blind person. Checking an assortment according to varying individual orders will preclude proper performance of some jobs in this category. Avoid positions where serial numbers, grade codes, order and model numbers, colors, sizes, etc. must be noted and/or compared with orders or stock lists. Where weighing is required the job must be avoided unless the scales may be read by tactual or aural perception.

Combination Jobs: Job combinations are machine loading and off-bearing, non-visual inspection, final assembly, carton set-up or trucking. Several of these operations may be combined to be the continuous responsibility of an operator, or the operator may change from one to another at stated intervals in order to relieve nervous tension and fatigue.

## WRAPPING AND PACKAGING

PACKER, SMALL PARTS

1. Name Used for Position in Plant Surveyed: Packer, small parts

D.O.T. Title: Packer II

Code: 8-94.65

Alternate Titles: Boxer, carton boxer, container packer, crater, package packer, packing clerk, packman.

D.O.T. Definition: (A Laborer or a Laborer Process)

Packs finished and wrapped products of an establishment in cardboard or wooden boxes, cartons, kegs, or other containers preparatory to shipment or storage; neatly folds, stacks, or otherwise arranges the articles in the container, using excelsior, wastepaper, or other material as necessary to prevent breakage or damage. May, while packing, weigh articles and inspect them for size, color, defects, or other items and keep a record of articles packed. May be specifically designated according to article packed.

Items Worked on in Plant Surveyed: Roller chain parts

2. Usual Operator:

a. Sex: Female

b. General Characteristics: Any size; quick movements, especially of the fingers and hands; average or less mental ability.

3. Physical Demands:

a. Activities: Turning, sitting, reaching, lifting, pushing, pulling, handling, fingering, feeling, working speed.

b. Working Conditions: Inside, noisy, adequate lighting and ventilation; working around others.

LOOK FOR THIS TYPE OF JOB IN THE COURSE OF EACH PLANT SURVEY.



## WRAPPING AND PACKAGING

PACKER, SMALL PARTS (Cont'd)

- c. Skill Required: Unskilled; worker must have ability to manipulate small parts and cartons and to locate accurately items within arm's reach; must have at least moderate skill at locating positions on work table in order to dispose of packed cases; must develop skill in judging number of parts being pushed into chute.
4. Details of Physical Activities: Sits all day on stool at work table; reaches to secure hands full of small parts and to stack filled cases at end or back side of work table; fingers small parts to push them into a spout and to remove excess from small weighing tray; also fingers small cartons to open them up and tuck in flaps; if blind, must feel to detect movement of scale parts, or hear to determine buzz of indicator; pushes and pulls containers weighing five to ten pounds to move them to or from storage position on table.
5. Details of Working Conditions: Works inside in well lighted and well ventilated room; clean surroundings; considerable noise at times caused by operation of adjacent machinery. Other workers will be located in adjacent positions or on opposite side of work table but no coordination with others is required.
6. Hazards: None
7. Sequence of Steps in Position in Plant Surveyed:
- (NOTE - Scales have been adjusted according to procedure shown in Item 8-b, for 20 or 100 items per box as the case may be)
- a. Scoops several handsfull of parts from bucket on table by floor worker and places them in the storage tray located above the right hand platform of the scale.

LOOK FOR THIS TYPE OF JOB IN THE COURSE OF EACH PLANT SURVEY.

## WRAPPING AND PACKAGING

PACKER, SMALL PARTS (Cont'd)

- b. With the fingers of the right hand, drags parts from storage tray into the spout, which deposits them in the weighing tray on the platform. An intermittent buzz indicates that approximately the right number of parts have been deposited. When the buzzing becomes steady, there is at least one extra piece in the tray.
- c. Removes pieces one at a time from the weighing tray until the buzzing ceases, at which point it will contain the correct number of parts.
- d. Secures small carton from stack on the table, opens it, tucks in the bottom, empties the content of the weighing tray into it and closes the carton.
- e. In the case of the 20-piece boxes, they are packed into a larger carton which will hold 10 of them; when this container is full, closes it and stacks it at the left hand end of the table for removal by floor worker. In the case of the 100-piece boxes, they are not packed in a carton but stacked directly on the table when filling is completed.

NOTE: In some cases the balance scales are not equipped with buzzers, in which event the motion may be detected by placing fingers of the left hand at the point where the moving end under the left hand platform normally rests on the base casting of the scale. When the correct number of pieces have been deposited in the weighing scale, the fingers will detect the moving part of the scale rising to a higher position, and will judge whether the distance it has risen indicates the exact weight or over-weight. The sighted operator determines whether the scale is in exact balance by observing the position of the pointer. If this pointer is not enclosed, it may be tactually observed by a blind worker.

In some instances the workers count the parts directly without the use of the scale, much in the manner in which coins are counted.

LOOK FOR THIS TYPE OF JOB IN THE COURSE OF EACH PLANT SURVEY.

## WRAPPING AND PACKAGING

PACKER, SMALL PARTS (Cont'd)8. Equipment as Found in the Particular Plant Surveyed:

- a. Identification: Detectogram balance scale, range up to 3 lbs. with enclosed indicating pointer; storage tray with spout leading out of front left corner, mounted approximately 3" above right hand platform of scale; small weighing tray; small balance tray and supply of small shot; flat top work table. In the plant surveyed, the balance was equipped with electric buzzer described in Item 16.
- b. Set-up and Maintenance: Plant mechanic locates balance scale on table; connects up buzzer indicator and maintains working condition of apparatus. Worker sets balance for a given quantity of any particular part being packed. This is accomplished by counting into the weighing tray the desired number of the particular part and placing this load on the right hand platform. Small shot are then deposited in the balance tray located on the left hand platform until the scales come to a condition of balance.
- c. Modification: Where determination of balance is to be made by sound, an electric buzzer and contacts are installed. A small wooden block carrying a copper plate is clamped to the right hand portion of the frame of the balance; a light spring contact is clamped to the moving part and so adjusted as to make contact with the copper plate after the right hand platform has passed below the balance point. The circuit is then wired to a buzzer and batteries. In the plant surveyed, this modification was made in not over two hours at a cost of approximately \$3.00 for parts. Since contact is made only after the platform, on which the tray is being weighed, has moved below the balance point, the sensitivity and accuracy of scale is not affected. When it is desired to read the pointer by feeling its position, it will be necessary with some scales, to remove the glass cover from the pointer housing.

LOOK FOR THIS TYPE OF JOB IN THE COURSE OF EACH PLANT SURVEY.



## WRAPPING AND PACKAGING

PACKER, SMALL PARTS (Cont'd)9. Equipment Variations Which May be Found in Other Plants:

In some cases where sufficiently heavy items are being weighed, the operator may prefer to determine the balance of the scale by following the motion of the mechanism at a point where the platform supports move up and down in the frame of the balance. In some cases the platform scales may be used and the reading will then be determined by the motion of a beam. Some special counting scales can be so arranged that a number of similar parts are placed in a container on the scale and these will balance an equal or greater number of parts placed on the weighing platform. This ratio may range from one to one or as high as 100 to one. The action of these scales must usually be observed by following the motion of the end of the beam arm.

10. Usual Pre-employment Training: None11. Usual Training Procedure on the Job: The worker is given primary instruction by the foreman, immediate supervisor, or special plant training official. Additional coaching on the job will be given by the same persons and in some cases adjacent experienced workers will make helpful suggestions.12. Any Training Deviations Suggested for the Blind: In some cases it may be necessary to point out how the printing on the box relates to the position of the seam.13. Production:

a. Full: In various plants the production will be affected by the type of cartons, disposition of packages and securing of materials. In plant surveyed production rate was 20-piece boxes, 70 per per hour; 100-piece boxes, 44 per hour.

b. Time to Reach Normal Efficiency: Three to four weeks in plant surveyed.

LOOK FOR THIS TYPE OF JOB IN THE COURSE OF EACH PLANT SURVEY.

## WRAPPING AND PACKAGING

PACKER, SMALL PARTS (Cont'd)

14. Interrelation with Preceding and Succeeding Jobs: Usually there is no direct interrelation with other jobs or other workers; daily production must keep pace with plant production.

15. Teaming with Other Workers: None

16. Modification, Deviation, Special Tools for the Blind:

Modification in the plant surveyed is indicated in Item 8-c (electrical buzzer). Similar sound indicators may be found desirable for sighted workers to relieve the monotony of watching the movement of the pointer or to give the supervisor a method of inconspicuously checking on the work being done. The need for and the type, extent, and cost of modification of counting scales will vary with the type of scales and duty performed.

17. Sight Requirements and Conditions:

a. Vision Required for the Job: None

b. Conditions affecting Suitability of a Particular Job:

1. For the Totally Blind: No travel to secure parts or supplies; no reading or recording of orders; no visual inspection; counting scales must have suitable points of observation of balance or be equipped with an audible indicator.

2. For the Partially Sighted: Conditions of illumination, travel and inspection must be compatible with eye condition. Tactual observation of balances is usually preferable, while lamp indicator may be acceptable in some cases.

18. Avoid the Following Conditions: Visual inspection; excessive travel for parts or supplies; the tallying, checking or filling out of orders or production records.

LOOK FOR THIS TYPE OF JOB IN THE COURSE OF EACH PLANT SURVEY.

## WRAPPING AND PACKAGING

PACKER, SMALL PARTS (Cont'd)

19. Other Jobs Often Combined for Full Time Employment: Carton set-up; filling or wrapping machine operation; hand counting; wrapping and packaging.
20. Industries, Parts of Industries or Types of Plants Where This Type of Job is Frequently Found:

This job is most frequently found in plants making small parts which are packaged and sold by number. Such items are bolts, nuts, lag screws, spring, bushings, small machine parts and stampings. Frequently these plants are listed as bolt and nut, screw machine, metal stampings, or metal products. In some plants where the major packing and carton filling is done by machine, the hand cutting or weight counting may be used to fill special or short orders for which it is not profitable to set up a machine.

LOOK FOR THIS TYPE OF JOB IN THE COURSE OF EACH PLANT SURVEY.



## WRAPPING AND PACKAGING

FOLDER AND TIER

1. Name Used for Position in Plant Surveyed: Folder and Tier

D.O.T. Title: Folder I

Code: 9-63.41

Alternate Titles: None

D.O.T. Definition: Packer (II) who neatly folds articles  
(usually items of clothing) before packing.

Items Worked on in Plant Surveyed: Cloth napkins

2. Usual Operator:

a. Sex: Female

b. General Characteristics: Young girls preferred; for napkins girls of any size; for folded tablecloths tall girls have an advantage because of reaching; workers should have quick, agile movements of fingers, hands and arms; type of worker suited to continuous, rapid, monotonous light work; no special mental ability.

3. Physical Demands:

a. Activities: Turning, sitting, reaching, lifting, pushing, pulling, handling, fingering, feeling, working speed.

b. Working Conditions: Inside, noisy, adequate lighting and ventilation; working around others.

c. Skill Required: Unskilled; worker needs deftness at finger manipulation of string or light tape; good orientation within arm's reach; should be skillful at interpreting and determining information obtained by tactual perception.

4. Details of Physical Activities: Sits all day at work table; turns to left or right to obtain or dispose of stacks of finished products which are pushed or pulled along the

LOOK FOR THIS TYPE OF JOB IN THE COURSE OF EACH PLANT SURVEY.

## WRAPPING AND PACKAGING

FOLDER AND TIER (Cont'd)

table; may have to reach three to four feet to obtain stack of product; when picking up napkins in lots of a dozen, must feel to determine that entire amount has been obtained; must work rapidly, accurately, and have good orientation so that stacks of napkins will not be upset.

5. Details of Working Conditions: Works inside in a well lighted and ventilated room with other workers at adjacent positions at the table; noisy because of a number of power sewing machines operating in the same room.
6. Hazards: None
7. Sequence of Steps in Position in Plant Surveyed:
  - a. From supply space at left end of table obtains stack of ten or more dozen lots of napkins and pulls it over to convenient work position.
  - b. With left hand places a dozen lot on the table immediately in front of her, while with the right hand obtains end of tying tape.
  - c. Passes tape around lot in two directions, tying with a single bow knot, and cuts off tape with a pair of scissors.
  - d. Places tied lot on stack to the right, alternating the direction of the long dimension of each lot. When the entire stack has been tied, pushes it along the table into the supply area for the bundler, being careful not to knock over the other stacks already in the area.

NOTE: Square napkins are folded to half dimension one way and third dimension the other, resulting in a folded dimension approximately 8 x 12 inches. They are grouped in lots of a dozen, which are then cross-stacked in order to retain the identity of each lot. Stacks must be built uniformly so that they will not fall over easily.

Care must be exercised to have tape wrapped snugly around the lot but not tight enough to distort it.

LOOK FOR THIS TYPE OF JOB IN THE COURSE OF EACH PLANT SURVEY.

## WRAPPING AND PACKAGING

FOLDER AND TIER (Cont'd)

8. Equipment as Found in the Particular Plant Surveyed:
  - a. Identification: Work table; scissors; holder for spool of tape.
  - b. Set-up and Maintenance: None; floor worker will place new spool of tape in position when required.
  - c. Modification: None
9. Equipment Variations Which May be Found in Other Plants:

Substantially the same in all plants.
10. Usual Pre-employment Training: None; however, any type of factory work experience is advantageous.
11. Usual Training Procedure on the Job: New worker is instructed by immediate supervisor or special training officer; follow-up coaching and suggestions as to special shortcuts are often supplied by adjacent fellow-workers.
12. Any Training Deviations Suggested for the Blind: None
13. Production:
  - a. Full: 150 dozen per hour.
  - b. Time to Reach Normal Efficiency: Three weeks.
14. Interrelation with Preceding and Succeeding Jobs: Supply space on table allows storage of only enough napkins for a short run; worker must keep up with pace set by folders or cause congestion and reduction in output of entire line.
15. Teaming with Other Workers: No direct teaming, but care in placing stack of tied napkins in supply area facilitates work of succeeding operator.
16. Modification, Deviation, Special Tools for the Blind: None

LOOK FOR THIS TYPE OF JOB IN THE COURSE OF EACH PLANT SURVEY.



## WRAPPING AND PACKAGING

FOLDER AND TIER (Cont'd)

17. Sight Requirements and Conditions:
- a. Vision Required for the Job: None
  - b. Conditions affecting Suitability of a Particular Job:
    - 1. For the Totally Blind: No inspection; no travel to obtain products or supplies.
    - 2. For the Partially Sighted: Travel and lighting conditions, color determination, and inspection required must be compatible with the type and amount of vision of the worker.
18. Avoid the Following Conditions: Situations where tier is required to sort and place into stacks according to weave pattern.
19. Other Jobs Often Combined for Full Time Employment: Folding, building, tying, straightening, folding of table-cloths, and wrapping.
20. Industries, Parts of Industries or Types of Plants Where This Type of Job is Frequently Found:
- Cloth mills doing weaving; finishing mills; processors of cloth; linen supply factories.

LOOK FOR THIS TYPE OF JOB IN THE COURSE OF EACH PLANT SURVEY.

WRAPPING AND PACKAGING  
COUNTING MACHINE OPERATOR

1. Name Used for Position in Plant Surveyed: Counting Machine Operator.

D.O.T. Title: Packer II (any industry)

Code: 8-93.07

Alternate Titles: Boxer, carton boxer; container packer; crater; package packer; <sup>1</sup>/<sub>2</sub>acking clerk; packman.

D.O.T. Definition: Packs finished and wrapped products of an establishment in cardboard or wooden boxes; cartons; kegs; or other containers preparatory to shipment or storage; neatly folds, stacks, or otherwise arranges the articles in the container, using excelsior, wastepaper, or other material as necessary to prevent breakage or damage. May, while packing, weigh articles and inspect them for size, color, defects, or other items and keep a record of articles packed. May be specifically designated according to article packed.

Items Worked on in Plant Surveyed: Unprinted crown caps.

2. Usual Operator:

a. Sex: Female

b. General Characteristics: Any size; good manual ability; average or less mental ability; able to withstand noise and vibration.

3. Physical Demands:

a. Activities: Sitting, turning, reaching, lifting, handling, fingering, and feeling.

b. Working Conditions: Inside, dusty, noisy, adequate lighting and ventilation, mechanical hazards, working around others, working alone.

LOOK FOR THIS TYPE OF JOB IN THE COURSE OF EACH PLANT SURVEY.

## WRAPPING AND PACKAGING

COUNTING MACHINE OPERATOR (Cont'd)

- c. Skill Required: Unskilled; ability to manipulate small cardboard cartons and retain location of machine parts, controls, and boxes within arm's reach.
4. Details of Physical Activities: Sits at operating position in front of machine, turns and reaches to left or right to obtain blank cartons and dispose of filled ones; pushes filled shipping case to one side to make room for an empty one; fingers small cartons to set them up and close them after filling, detecting by feel that the operation has been properly accomplished. Determines own production by speed with which cartons are handled.
5. Details of Working Conditions: Works inside in clean, adequately lighted and ventilated surroundings, around others on fill-in-jobs, but alone on major operations. Location is noisy and there is considerable vibration due to the operation of printing and stamping machines; nearby noises and vibrations pulsating in rhythm are annoying to some workers. Hand trucks move only in the aisles.
6. Hazards: None
7. Sequence of Steps in Position in Plant Surveyed:
- a. With left hand obtains chip board carton (approximately 2" x 4" x 6"); opens and tucks in bottom.
  - b. With right hand removes filled carton from under filler spout, and with left hand sets an empty in its place. Trips operating lever to start machine, which deposits one gross of caps in the carton and then shuts off.
  - c. Closes top and places in shipping case which will hold 36 of these one-gross cartons.
  - d. When shipping case is filled, closes flaps and pushes it to one side for removal by floor worker. Floor worker who removes filled cases also brings supplies, including set-up shipping cases, and fills machine hopper with caps.

LOOK FOR THIS TYPE OF JOB IN THE COURSE OF EACH PLANT SURVEY.



## WRAPPING AND PACKAGING

COUNTING MACHINE OPERATOR (Cont'd)8. Equipment as Found in the Particular Plant Surveyed:

- a. Identification: The special counting machine (designed and constructed in this particular plant) is motor driven. Loose caps are deposited in a large hopper from which they automatically feed down the filler spout through a counting mechanism. When one gross has passed the counting mechanism, it automatically stops the machine. The only operating control is a lever for starting tables, benches which hold supplies and the shipping case as it is being filled.
- b. Set-up and Maintenance: Setting up equipment; maintenance and adjustment of the machine are the duties of the plant mechanic.
- c. Modification: None

9. Equipment Variations Which May be Found in Other Plants:

Other plants would have their own design or standard machines for this purpose, operating on a similar principle.

10. Usual Pre-employment Training: None11. Usual Training Procedure on the Job: Supervisor explains details to new worker and coaches her as long as required.12. Any Training Deviations Suggested for the Blind: None13. Production:

- a. Full: No check has been made or standard set for production on this machine, since its full daily output is not required and the usual procedure is to use it as a fill-in for extra workers from other jobs.
- b. Time to Reach Normal Efficiency: One to two weeks.

14. Interrelation with Preceding and Succeeding Jobs: None

LOOK FOR THIS TYPE OF JOB IN THE COURSE OF EACH PLANT SURVEY.

## WRAPPING AND PACKAGING

COUNTING MACHINE OPERATOR (Cont'd)

15. Teaming with Other Workers: None
16. Modification, Deviation, Special Tools for the Blind: None
17. Sight Requirements and Conditions:
- a. Conditions affecting Suitability of a Particular Job:
1. For the Totally Blind: No travel to obtain supplies or disposal of finished products.
2. For the Partially Sighted: Lighting and travel conditions must be compatible with the type and amount of vision of the worker.
18. Avoid the Following Conditions: Inspection, tallying, or reading of orders, and also for the totally blind, travel to obtain supplies.
19. Other Jobs Often Combined for Full Time Employment: This job may be combined with many other packaging operations. In the plant surveyed it was combined with the job of removing cork liners from defective caps.
20. Industries, Parts of Industries or Types of Plants Where This Type of Job is Frequently Found:

Any industry making small parts which are packaged and sold by number, such as bolt and nuts, tacks, small metal stampings, and screw machine products.

LOOK FOR THIS TYPE OF JOB IN THE COURSE OF EACH PLANT SURVEY.

## WRAPPING AND PACKAGING

HOOPER AND NAILER1. Name used for Position in Plant Surveyed: Hooper and NailerD.O.T. Title: Case StrapperCode: 9-63.41Alternate Titles: Metal stayer; packing-case strapper; tier; wire-tying-machine operator.

D.O.T. Definition: Ties several small boxes together, or binds packed wooden shipping cases or boxes with wire, by means of a hand operated wire-tying machine, to reinforce and hold boxes together during shipment; attaches one end of wire in one chuck of machine; wraps wire around stacked boxes or packing case; attaches other end of wire in the other chuck of the machine; pushes hand levers to draw wire tight about case; twists ends together, and cuts off excess wire. May fasten covers on boxes (reference, Lidder) and perform other duties as assigned.

Items Worked on in Plant Surveyed: Cardboard and wooden shipping cases filled with finished cloth; cardboard cartons weighing 50 to 320 lbs.; wooden boxes from 150 to 425 lbs.

2. Usual Operator:a. Sex: Maleb. General Characteristics: Medium to large size; good physical strength and stamina; average mental ability.3. Physical Demands:a. Activities: Walking, standing, turning, stooping, crouching, reaching, lifting, carrying, pushing, pulling, handling, fingering, feeling, talking, working speed.

LOOK FOR THIS TYPE OF JOB IN THE COURSE OF EACH PLANT SURVEY.



## WRAPPING AND PACKAGING

HOOVER AND NAILER (Cont'd)

- b. Working Conditions: Inside, noisy, adequate lighting and ventilation, moving objects, cramped quarters, working with others, working around others, working alone.
  - c. Skill Required: Unskilled; sufficient ability with hammer and hatchet to drive nails accurately into edge of one-inch boards; sufficient finger dexterity to properly and quickly thread one-half inch wide thin steel strap material into banding machine and apply clips; sufficient tactual perception to differentiate between thin and thick sheets of paper; ability to judge accurately the placing of boards, nails and bands with respect to the edge of the box; ability to move accurately from one work stand to another and to the stacks of cartons within five or six feet of work line; ability to lift properly.
4. Details of Physical Activities: Walks from one work stand to another, or to stack of boxes nearby; stands, stoops, crouches and reaches to secure lid boards and place them in position on the box, or to close lid of cardboard cartons, and to place metal bands around the container; lifts and carries cartons, placing them on a nearby stack; pushes or pulls large cartons to tumble them off the work stand; fingers metal bands to place them in proper slots in tightening machine and to place clip in position on the bands; fingers packing sheets to know which one to put inside the box before it is lidded and to tuck remaining packing sheet under a band; talks with adjacent worker and cooperates with him when assistance is necessary to handle very large boxes.
5. Details of Working Conditions: Works inside in clean, well ventilated surroundings with only one or two workers nearby; area may be noisy because of hammering by other workers and operation of machinery. Trucks move in aisle adjacent but not through work position; seeks from, or gives assistance to adjacent worker when a large size case is to be handled.

LOOK FOR THIS TYPE OF JOB IN THE COURSE OF EACH PLANT SURVEY.

## WRAPPING AND PACKAGING

HOOPER AND NAILER (Cont'd)

6. Hazards: Worker may hurt his fingers from inaccurate pounding or may strain himself from improper lifting of heavy items. This may be avoided if proper methods of lifting are understood. The worker must be careful to remain in work position between stands in order to avoid collision with moving trucks.

7. Sequence of Steps in Position in Plant Surveyed:

Cardboard cartons and wooden boxes are brought in by truckers and placed on platforms in a row on the floor. The platforms are approximately 5" high and the row about 70' long. Room is left between each platform for adequate working space. Each row is completed before the ladder starts working on it.

- a. Opens the lid of the box and removes the heavy copy of the packing sheet, placing it into his pocket. (The tissue copy remains on top of the cloth).
- b. Turns in liners and
  - (1) for cardboard cartons, closes flaps, or
  - (2) for wooden boxes, places ready-cut lid boards in position on top of box.
- c. Obtains tightening machine and end of band iron from supply cart, placing the machine on the top of box and passing the band over and around one of the overhanging ends of the box; slips end and the main strand of the band, edge wise, edge-wise, into the proper slots into the tightening machine, moving the fastening lever to secure them in position; operates handles back and forth in a direction parallel to the band, tightening the band until it just begins to sink in at the corners of the box; clip, taken from tray on the supply cart, is placed over the band at the center of the tightening machine; pulls handles toward himself to crimp the clip and secure the band; removes machine to position on the supply cart; grasping the main strand of the band in one hand moves it up and over in such a way as to form

LOOK FOR THIS TYPE OF JOB IN THE COURSE OF EACH PLANT SURVEY.

## WRAPPING AND PACKAGING

HOOPEE AND NAILER (Cont'd)

a sharp bend at the end of the clip; moves the band back and forth until it breaks off at the end of the clip.

- d. Repeats, placing band on the other overhanging end of the box.
  - e. Places two bands around the box crossway from the original banding; the banding iron is passed through tunnels formed by the bottom of the box and channels in the top of the platform.
  - f. For wooden boxes, drives nails through end of lid boards into edges of the side boards.
  - g. Tips box off of platform on to its side on the floor. In the case of small cartons the ladder may stack them one or two cases high.
  - h. Tucks heavy copy of packing sheet under one of the bands. Box is then removed by trucker.
8. Equipment as Found in the Particular Plant Surveyed:
- a. Identification: Platform stands about 5" high for supporting cartons in work position; small two-wheel cart with compartments for holding nails, clips and tools, with reels of banding material mounted on the side; hammer and hatchet; signode hand banding machine for tightening bands and fastening with clips.
  - b. Set-up and Maintenance: None required.
  - c. Modification: None required.
9. Equipment Variations Which May be Found in Other Plants:

Roller or belt conveyors may be used for bringing the loaded boxes to or taking them away from the work position. Where heavy straps are used the tightening machine may be motor driven. In some cases wire may be used instead of flat straps. With some model hand machines, it may be necessary to crimp the clip with special separate pliers.

LOOK FOR THIS TYPE OF JOB IN THE COURSE OF EACH PLANT SURVEY.



## WRAPPING AND PACKAGING

HOOVER AND NAILER (Cont'd)

10. Usual Pre-employment Training: Before going on the job, if wooden cases are to be lidded, the worker should be skilled at driving nails. In any case he should have experience and ability in the use of hand tools.
11. Usual Training Procedure on the Job: Simple instructions as to requirements of the job and any special short-cuts are given by the immediate supervisor or an experienced fellow worker.
12. Any Training Deviations Suggested for the Blind:

None, except that where wooden cases are to be lidded blind workers previously should have developed good skill in driving nails.

13. Production:

- a. Full: In the plant surveyed, worker averaged 80 wooden cases or 90 cardboard cases closed per day. There will be considerable variation depending upon the size of the cartons, method of conveying, the disposition of any packaging sheets, and the number of straps to be applied.
- b. Time to Reach Normal Efficiency: In the plant surveyed, the worker was expected to reach normal efficiency within two or three months. In other plants and situations, he may be expected to reach full efficiency in a period as short as one week.

14. Interrelation with Preceding and Succeeding Jobs:

Worker must keep up with the average output of preceding department. When working off a conveyor, there may be little reserve of boxes available, and he may be required to work very rapidly for short periods of heavy flow of boxes. In some cases a slackening of the worker's production would cause a temporary stoppage of the production line.

LOOK FOR THIS TYPE OF JOB IN THE COURSE OF EACH PLANT SURVEY.

## WRAPPING AND PACKAGING

HOOPER AND NAILER (Cont'd)

15. Teaming with Other Workers: Where heavy boxes are handled, two adjacent workers may combine their efforts in handling the containers. If the entire production is heavy, they may work regularly as partners. There must be a good mutual understanding of duties and methods in order to maintain production and avoid injuries.
16. Modification, Deviation, Special Tools for the Blind: None
17. Sight Requirements and Conditions:
- a. Vision Required for the Job: None
  - b. Conditions affecting Suitability of a Particular Job:
    - 1. For the Totally Blind: Requirements for reading shipping orders or lot numbers, or segregation of containers according to brand labels; no travel beyond work area.
    - 2. For the Partially Sighted: Adequate lighting; with travel, reading requirements and physical demands compatible with the worker's type and amount of vision and eye condition.
18. Avoid the Following Conditions: For the totally blind, the stacking of medium or large boxes; trucking to or from the work area; sorting where visual identification is necessary. For the partially sighted, extensive travel through heavy traffic conditions; heavy physical exertion or lifting not compatible with eye condition.
19. Other Jobs Often Combined for Full-Time Employment: Trucking and shipping.
20. Industries, Parts of Industries or Types of Plants Where This Type of Job is Frequently Found:
- Manufacturers of cloth, cut paper, wall board, composition shingles and other articles heavy in proportion to size. Many packages are banded for export shipments which do not require this treatment for rail transportation. In such cases, banding may be done by a forwarding company at the port of shipment.

LOOK FOR THIS TYPE OF JOB IN THE COURSE OF EACH JOB SURVEY.

## WRAPPING AND PACKAGING

BAG FILLER

1. Name Used for Position in Plant Surveyed: Bag Filler

D.O.T. Title: Filling Machine Operator (I) (any industry)

Code: 7-68.032

Alternate Titles: Bagger; packer; packer-machine operator; packer man; packing machine operator; sack filler; sacker; scaler-packer; spout filler.

D.O.T. Definition: Fills sacks, bags, or other containers with loose material, such as flour, sugar or cement, using a machine that automatically fills the container with the desired weight of material; encircles filling spout of machine with neck of container; (1) trips a lever causing material to flow into spout until scale mechanism in spout automatically stops flow of material and then pulls a slide in lower end of spout to drop material into container, or (2) pulls a slide in spout to cause material to flow directly into container until scale platform on which container rests automatically actuates a mechanism stopping flow of material; places filled container aside for removal or places it on a conveyor; periodically checks accuracy of weighing mechanism in machine by weighing a filled container on a test scale. May adjust weighing mechanism and keep such records as the number or weights of containers filled.

Items Worked on in Plant Surveyed: Powdered pigment

2. Usual Operator:

a. Sex: Male

b. General Characteristics: Good stamina and physical strength in hands, arms and shoulders; medium to large size; average mental ability, with an aptitude for the operation of machinery. Colored workers used on this job in the plant surveyed.

LOOK FOR THIS TYPE OF JOB IN THE COURSE OF EACH PLANT SURVEY.



## WRAPPING AND PACKAGING

BAG FILLER (Cont'd)3. Physical Demands:

- a. Activities: Walking, climbing, crawling, standing, turning, reaching, lifting, carrying, handling, fingering, feeling, talking, hearing.
- b. Working Conditions: Inside, dusty, noisy, adequate lighting and ventilation; mechanical hazards, high places, working with others, working around others.
- c. Skill Required: Unskilled; ability to orient and move accurately within work area of approximately 12 feet; skill at judging the amount of material to add or subtract from a bag in order to trim to the proper weight; ability and habit of lifting properly in order to minimize the degree of fatigue; ability to comprehend difficulties with machinery and act quickly in cases of emergency.

4. Details of Physical Activities: Walks around work area approximately 10 x 15 feet; occasionally climbs and crawls to reach parts of the equipment to be cleared; stands in work position, turns and reaches for empty bag and puts bag into position on spout of machine; feels and fingers end of bag to gain proper hold for opening, handles it to slip it over the spout and straighten out the bottom; lifts 50 lb. bag from platform, carrying it approximately three steps to the scale, or lifts it from the scale to the conveyor feeding the tying machine, and again from the tying machine conveyor lifts and carries it to platform truck, a distance of from two to five feet; talks with partner to coordinate work and continually listens to equipment to determine its operating condition.

5. Details of Working Conditions: Works inside in dusty, adequately lighted and ventilated surroundings, where there is a constant drumming, pulsating noise of heavy grinding machinery which makes conversation difficult; mechanical hazards from the tying machine which is partially guarded can be avoided by proper procedure. When operating the filling machine, stands on platform about 18" high, so must maintain good orientation to avoid stepping off. Works with a partner, changing off each hour,

LOOK FOR THIS TYPE OF JOB IN THE COURSE OF EACH PLANT SURVEY.

## WRAPPING AND PACKAGING

BAG FILLER (Cont'd)

and in second position must maintain pace set by partner; hand trucks are working in the area from time to time.

6. Hazards: Operator when working in the first position must exercise care not to step off the platform; in the second position the worker's hands and arms would be seriously hurt if they became entangled in the tying mechanism which is guarded except for the sides where the bag enters and leaves. The worker must be careful to let go of the bag promptly after placing it on the conveyor, but he may safely follow it through the machine if his hand is placed on the bottom of the side of the bag.

7. Sequence of Steps in Position in Plant Surveyed:

Two workers operate as a team, changing off on routine steps each hour. Other activities such as clearing or adjusting equipment, securing supplies, and stamping bags, may be regularly performed by the same worker according to mutual agreement.

The machine is started by pressing buttons on a control located to the right of the operating position. The equipment items are started in a definite sequence, and each is allowed to come up to speed as indicated by sound and vibration before the next unit is started. The sequence is: dust blower, filling machine, short conveyor, grinder and long feeder conveyor from the storage bin. The entire assembly of equipment may be stopped by the pressing of one button.

- a. Standing in front of the machine, secures bag from table at the right and uses both hands to open it. With a forward and upward motion slips it over the end of the discharge spout, pulling it up almost the entire length of the bag; gathers the top of the bag snugly around the spout where it is held with the right hand while the left hand finishes opening and straightening out the bottom.

LOOK FOR THIS TYPE OF JOB IN THE COURSE OF EACH PLANT SURVEY.

## WRAPPING AND PACKAGING

BAG FILLER 'Cont'd)

(Caution - If the bag is not held snugly around the spout a certain amount of pigment will blow out, causing the package to be underweight. If the bottom is not properly straightened the bag will only partly fill and have to be set aside for later adjustment).

- b. With the right foot steps on pedal and starts filling operation, also causing the platform to rise up under the bag to take the weight as it is filled. This platform slowly lowers as material is deposited into the bag. When the proper amount of material has been deposited the machine stops, as indicated by change in noise.
- c. Steps on second pedal to lower platform quickly to the floor and grasping top of the bag with both hands, sets it over to the left onto the platform of the scales. (Seats bag firmly on the scale so it will not upset).
- d. Trims weight of bag to within two ounces, plus or minus, of fifty pounds, by using the hands to remove or add material. (In plant surveyed the scale used gave indications on an enclosed dial).
- e. (Second worker takes over at this step)  
Grasping the top of the bag with both hands sets it on to the conveyor belt which will carry it through the tying machine. Before releasing the bag, forms the top into a long narrow opening parallel to the direction of travel of the bag so that it will properly enter the gathering mechanism of the tying machine.
- f. After bag has passed through tying machine, lifts it and places it on a nearby platform truck for removal by other workers. A blind operator should follow the progress of the bag through the tying machine by keeping the right hand in contact with the bottom of the side of the bag, and thus be able to remove it promptly after it has cleared the machine.

Second operator utilizes intervals when no bags are being filled, to stamp date and other information on empty bags. Large table adjacent to the operating position is used for this purpose.

LOOK FOR THIS TYPE OF JOB IN THE COURSE OF EACH PLANT SURVEY.



## WRAPPING AND PACKAGING

BAG FILLER (Cont'd)8. Equipment as Found in the Particular Plant Surveyed:

- a. Identification: The main equipment is the Pneumatic Scale Company's large bag filling machine No. 4578, similar to the flour packing machine No. 2521. This machine is served by a grinder and storage bin with necessary conveyors and a dust collecting blower. Motor controls are brought to a push button panel located to the right of the operating position. Also there are automatic controls at several points to stop machinery if excess material accumulates at those points.

The scale used is the Toledo (enclosed dial type) Dial No. 31-1801.

The tying machine is a Hamer which automatically gathers the top of the bag, encircles it with wire, the ends of which it twists together and fastens. It includes a belt conveyor to carry the bag through the machine. Other equipment includes a work table, stamping bag, platform for holding supply of stamped bags, and bin located to the right of the scales to hold pigment material used in trimming weight of the bag.

- b. Set-up and Maintenance: The major set-up and continuing overall mechanical and electrical condition of the equipment and its general maintenance is the responsibility of the plant mechanic. As the daily work progresses the condition of the powdered pigment varies slightly in such characteristics as moisture content and grind, which will necessitate the operator making adjustments by turning the crank at the left of the operating position in order to increase or decrease the amount of material deposited in each bag. When feed channels become clogged, resulting in a change of noise or a decrease or shortage of material, it will be necessary for the operator to shut down the equipment, clear out the clogged portion or call a plant mechanic if the difficulty is serious.

- c. Modification: None

LOOK FOR THIS TYPE OF JOB IN THE COURSE OF EACH PLANT SURVEY.

## WRAPPING AND PACKAGING

BAG FILLER\*9. Equipment Variations Which May be Found in Other Plants:

The equipment will usually be substantially the same. However, the supply, check-weighing, and tying equipment may vary considerably according to the plant and type of bag being used. Usually some form of continuous feed to the hopper of the machine is provided. The scales will often be of the beam type; in other cases audible or visible light signals may be used in conjunction with the dial scale. The closing of the bag may be done by hand or in the case of cloth bags by a special sewing machine. In many cases conveyors are provided for removing the bags.

10. Usual Pre-employment Training: None. The usual procedure is to hire workers in good physical condition who have had previous experience stacking and handling similar material.

11. Usual Training Procedure on the Job: Supervisor explains each step of the operation to the new worker, watches his progress for a while and leaves it for his experienced partner to continue the coaching.

12. Any Training Deviations Suggested for the Blind: The employment counselor should supervise the training of the new blind worker on the job. Two experienced workers should be on the job and the blind worker should take over only one step at a time until he becomes familiar with each one, after which he can take over the entire operation of either position. The employment counselor must have previously become familiar with the alternative methods of observation (used instead of sight) such as noise and vibration and be able to point them out to the blind worker. He should also be sure that a mutually satisfactory and equitable division is made of auxiliary duties such as obtaining supplies, stamping bags, clearing and adjusting equipment.

13. Production:

a. Full: The nominal rate is 1600 bags per 8 hour shift

LOOK FOR THIS TYPE OF JOB IN THE COURSE OF EACH PLANT SURVEY.

## WRAPPING AND PACKAGING

BAG FILLER

(120 tons per 24 hours). Actual production records show an average of 106 tons per 24 hours, reduction being caused by conditions beyond the control of the filler operator. (The care with which the filling machine is adjusted and the snugness with which the bag is held in position around the spout contribute to the accuracy of the filling of each bag, thus reducing the amount of trimming necessary and raising the over-all production).

b. Time to Reach Normal Efficiency: Three weeks.

14. Interrelation with Preceding and Succeeding Jobs: None. The 24-hour production must keep pace with the manufacturing production of the plant. The storage hoppers allow sufficient leeway for short shut-downs without disrupting the manufacturing process.
15. Teaming with Other Workers: The worker on the first position of this job sets the pace and the second worker must keep bags cleared away. The division of auxiliary duties between the operators should be made in such a way as to give the best over-all efficiency and be suitable and equitable.
16. Modification, Deviation, Special Tools for the Blind:

Usually there will be no modification required except in the case of the enclosed dial scale where the addition of equipment to give an audible indication will be required. Where this type of scale is already supplemented with light indicators, buzzers can be easily installed parallel with the lights. For the type found in the plant surveyed the manufacturer of the scale also can provide, as stock items, equipment for giving audible indication of the reading. The cost will be equal to approximately one-half the cost of the scale itself. This equipment is used by some companies in the case of their regular sighted workers, to give an audible signal for the benefit of the worker and as a suitable indication to the supervisor of how

LOOK FOR THIS TYPE OF JOB IN THE COURSE OF EACH PLANT SURVEY.



## WRAPPING AND PACKAGING

## BAG FILL (Cont'd)

the work is progressing. In cases where the value per pound of the material is high, the extra cost may be justified by the increased accuracy in weighing.

17. Sight Requirements and Conditions:

a. Vision Required for the Job: None, when teaming with sighted worker.

b. Conditions affecting Suitability of a Particular Job:

1. For the Totally Blind: The type of weighing equipment, the closeness of the tolerance and the frequency with which the packaging must be check-weighed will determine whether a totally blind person could operate the job. There should be no trucking for disposal of products, no requirements for determining brand labels on the package, tallying orders or lot numbers.

2. For the Partially Sighted: The amount of reading of orders, brands and scales, degree of lifting, and lighting conditions must be compatible with the degree and type of vision and eye condition of the worker.

18. Avoid the Following Conditions: Situations requiring trucking or long travel to secure supplies, or operation of the job without a sighted partner.

19. Other Jobs Often Combined for Full Time Employment: Trucking, warehouse stacking, other packaging operations, shipping.

20. Industries, Parts of Industries or Types of Plants Where This Type of Job is Frequently Found:

Flour and feed mills, seed companies, cement and sugar mills, fertilizer factories, or any other plant in which the product is in loose form and packaged in bags.

LOOK FOR THIS TYPE OF JOB IN THE COURSE OF EACH PLANT SURVEY.

## WRAPPING AND PACKAGING

ROLL HEADER

1. Name Used for Position in Plant Surveyed: Roll Header

D.O.T. Title: End Bander

Code: 8-56.61

Alternate Titles: Header

D.O.T. Definition: A Laborer process. Places cardboard disc over each end of roll of roofing materials; winds a piece of cloth over end of roll and glues it in place preparatory to shipment; glues a band of paper around cloth to hold it in place.

Items Worked on in Plant Surveyed: Rolls containing 70 linear feet of felt back floor covering, 8 or 12 quarters wide. (Quarter is a unit of measure used by the trade and equals one-quarter of a yard).

2. Usual Operator:

a. Sex: Male or female.

b. General Characteristics: Medium to large size; good physical stamina; average or less mental ability; rapid gross movements.

3. Physical Demands:

a. Activities: Walking, standing, turning, reaching, pushing, pulling, handling, fingering, feeling, seeing, working speed.

b. Working Conditions: Inside, noisy, adequate lighting, adequate ventilation, working with others, working around others.

c. Skill Required: Unskilled; job requires deftness in handling such items as wet gummed tape, discs of burlap and floor covering material, labels and glue brush, skill at judging location of burlap, disc and labels so that they will center up with the end of the roll.

LOOK FOR THIS TYPE OF JOB IN THE COURSE OF EACH PLANT SURVEY.

## WRAPPING AND PACKAGING

ROLL HEADER (Cont'd)

4. Details of Physical Activities: Walks around immediate work area and occasionally to supply room (a distance of approximately 100 feet); stands all day in work position; turns and reaches to get items from work table and to obtain roll of floor covering, pushing or pulling to cause it to roll along rails to or from the work position. Handles discs of floor covering up to 12 inch diameter, discs of burlap up to 18 inch diameter; gummed tape, glue brushes and light paper labels; fingers burlap to lay pleats after it has been put on the roll. Determines by touch that label and gummed tape have been pressed into position. Determines gross movements of working partner and location of roll.
5. Details of Working Conditions: Works in a clean, well lighted, ventilated, and properly heated room; noisy from the sounds of conveying, cutting and other machinery. Works with partner operating on other end of roll and near roll machine operator.
6. Hazards: Worker would be injured if he stumbled into the hole in the floor through which the chain conveyor passes.

NOTE: Hole is at least partially guarded on all sides. If rail extensions leading to lowering conveyor are not in proper position, roll might drop over end of fixed rail on to the worker's toes. Worker must be careful to remain in proper operating area and keep rail extensions closed whenever rolls are being handled.

7. Sequence of Steps in Position in Plant Surveyed:

NOTE: Rolls of floor covering come to the heading position wrapped and fastened in heavy paper and traveling past on rails. One header is operating in the work position at each side of the rail.

- a. Standing at the side of the rail moves roll into position, with the other hand secures wooden plug from work table and inserts it in the end of the roll as far as attached disc of floor covering material will permit.

LOOK FOR THIS TYPE OF JOB IN THE COURSE OF EACH PLANT SURVEY.



## WRAPPING AND PACKAGING

ROLL HEADER (Cont'd)

- b. Selects disc of scrap floor material equal to the diameter of the roll and places it over the end of the roll, secures it in position with a strip of gummed tape obtained from the dispenser, the tape being passed across the end and down the sides of the roll.
- c. Centers disc of burlap over the end of the roll, folding it down the sides, forming neat pleats; fastens it into position with gummed tape wrapped around the roll and lapping over the edges of the burlap.
- d. Brushes glue on burlap at end of roll, placing label indicating brand and pattern over the glued portion, and smooths it down with the hand.
- e. When both ends are completed, workers act in unison to push the roll along the rails and onto the conveyor, timing the movements so that it arrives on the loading position just after a set of carrying lugs on the conveyor chains has passed.

8. Equipment as Found in the Particular Plant Surveyed:

- a. Identification: Work table to hold tape dispenser, glue pail and supply of plugs, discs, burlap and labels, rails for items to roll past work position into lowering conveyor.
- b. Set-up and Maintenance: None
- c. Modification: None

9. Equipment Variations Which May be Found in Other Plants:

Substantially the same in all plants. Rolls may be deposited on trucks or other conveyance instead of onto lowering conveyor.

- 10. Usual Pre-employment Training: None. Previous factory experience is desirable and good physical condition essential.

LOOK FOR THIS TYPE OF JOB IN THE COURSE OF EACH PLANT SURVEY.

## WRAPPING AND PACKAGING

ROLL HEADER (Cont'd)

11. Usual Training Procedure on the Job: New worker observes experienced worker on the job, taking over one step at a time until the entire operation has been learned. He will be coached from time to time by experienced worker at other end of roll or by foreman.
12. Any Training Deviations Suggested for the Blind: None
13. Production:
  - a. Full: 20 - 12 quarter length rolls or 22 - 8 quarter length rolls per hour. (In the plant surveyed the workers on the line completed the hour's production in from 35 to 40 minutes and rested the remaining portion of the particular hour).
  - b. Time to Reach Normal Efficiency: Average worker must keep up with the line after three to four day's experience.
14. Interrelation with Preceding and Succeeding Jobs: Application of an incorrect label would lead to considerable confusion in the storage and shipping departments. Only one or two rolls may be stored on the rails between the roll machine and the heading position. Therefore, any lag on the part of the headers will cause a stoppage of the entire line.
15. Teaming with Other Workers: Action of the two headers in bringing the roll into working position and moving it into the lowering conveyor must be closely coordinated. Movement of the roll during the heading operation would slow down the work. Poor coordination in moving the roll onto the lowering conveyor might cause it to jam and damage the conveyor or the material.
16. Modification, Deviation, Special Tools for the Blind:

None required.

LOOK FOR THIS TYPE OF JOB IN THE COURSE OF EACH PLANT SURVEY.

## WRAPPING AND PACKAGING

ROLL HEADER (Cont'd)17. Sight Requirements and Conditions:

a. Vision Required for the Job: Partial vision. Sufficient sight to follow gross movements of the other header at a distance of 10 feet, to quickly judge approximate position on which to locate gummed tape and labels, and see outline of large lugs on conveyor at distance of four feet.

b. Conditions affecting Suitability of a Particular Job:

1. For the Totally Blind: Rate of operation would have to be reduced. The other header would have to be willing to assume responsibility for coordinating his motions with those of the blind worker and for securing paper labels and other supplies.

2. For the Partially Sighted: Lighting conditions compatible with the degree and type of vision available; sufficient vision to determine proper labels, or other worker must be willing to assume this responsibility.

18. Avoid the Following Conditions: For a totally blind worker: situations where he must be responsible for the selection of proper labels; where the roll is disposed of by depositing it onto a lowering conveyor requiring close timing. For partially sighted: situation where handling onto truck or other conveyors requires lifting that is not compatible with the worker's eye condition.

19. Other Jobs Often Combined for Full Time Employment: This job may be frequently combined with that of roller, wrapper, trucker, rug roller and tuber, and bundler according to the plant production and layout.

20. Industries, Parts of Industries or Types of Plants Where This Type of Job is Frequently Found:

The heading operation may be found throughout the country in any plant where the product is packaged in roll form. These include plants making products such as felt and other types of building paper; rolled roofing and wrapping paper; floor covering such as linoleum, carpets, cotton, woolen and grass carpets and rugs.

LOOK FOR THIS TYPE OF JOB IN THE COURSE OF EACH PLANT SURVEY.



HANDBOOK OF  
REPRESENTATIVE INDUSTRIAL JOBS FOR BLIND WORKERS

SPECIFIC INDUSTRY SERIES

Category SI-3

SLAUGHTERING AND MEAT PACKING

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HANDBOOK OF  
REPRESENTATIVE INDUSTRIAL JOBS FOR BLIND WORKERS

SPECIFIC INDUSTRY SERIES

SLAUGHTERING AND MEAT PACKING

General Information Sheet

Character of the Industry: The Slaughtering and Meat Packing

Industry slaughters and dresses cattle, sheep, lambs, calves, and hogs for sale as fresh or frozen meat. Certain cuts and trimmings are further processed into such products as canned meat, sausage, cured and smoked hams, shoulders, bacon, lard, and gelatin, and the nonedible parts are processed into such commodities as fertilizer and glue. All of these products may or may not be processed in the same plants where the slaughtering and dressing are done. In general, cattle, calves, lambs, and sheep are sold as whole carcasses, and hogs are sectioned.

Forty per cent of the pork is sold as fresh meat; fifty per cent is cured and smoked; and ten per cent is used in the manufacture of sausage and similar products. Ninety per cent of the beef is sold as fresh or frozen meat, and the remaining ten per cent is used in the manufacture of sausage and the like.

The size of the plants varies from those employing fifteen or twenty workers to those establishments employing several thousand workers.

Distribution of the Industry: The industry may be divided into three main groups: National, sectional, and local packers. The national packers have their plants located at the centers of livestock production in the corn belt and ship to their branch plants which are located throughout the country. Sectional packers are located at various population centers and ship to branch or privately owned plants within the area which they serve. These packers do very little manufacturing in comparison to that done by national packers. Local packers are almost exclusively engaged in the production of sausage and smoked meats. They purchase the ingredients, fresh and frozen, from national and sectional packers which interestingly enough also produce sausage and smoked meats.



## SLAUGHTERING AND MEAT PACKING

General Information Sheet (Cont'd)

A recent survey shows that there are approximately 3,500 Slaughtering and Meat Packing plants in the United States, most of which do a certain amount of manufacturing. Nearly 1,000 of these plants are exclusively engaged in the manufacture of sausage and smoked meats. Approximately 600 produce grease and tallow; fifty manufacture vegetable shortening; sixty process products into glue and gelatine; and twenty manufacture margarine.

Type of Workers Usually Employed: The work in this industry is generally of a heavy and strenuous nature with the result that many more men than women are employed. Women are usually employed on clerical jobs and for the lighter wrapping and packing operations. It is estimated that approximately eighty-five per cent of the persons employed are men; however, in a plant producing sausage and smoked meat, approximately thirty per cent of the employees are women. Nearly fifty per cent of the men are classified as laborers since a large number of the jobs require little or no skill.

Working Conditions: Most of the work is done in refrigerated rooms which are approximately 35°F., making it necessary for the workers to wear heavy clothing in order that they may withstand this uncomfortably low temperature.

Since the floors are constantly washed, they are wet with little pools of water collecting in depressions which result from long periods of wear; consequently, the work areas are damp. Certain jobs are performed in parts of the plant which are hot because of cooking and steaming operations, and workers must accustom themselves to, and dress for, these unavoidable conditions.

As a rule the plants are well lighted and ventilated; however, many workers are subjected to unpleasant odors which are unavoidable because of the very nature of the work.

Hours of work compare favorably with other industries. Daytime employment is customary, although considerable night work is done in the packing and shipping departments. Employment is quite steady with practically no seasonal peaks.

## SLAUGHTERING AND MEAT PACKING

General Information Sheet (Cont'd)

It will be found that union contracts are in force in most establishments and that union officials will endorse the employment of blind persons.

Many plants are located on the outskirts of town, which often creates transportation problems for the workers.

Safety Precautions, Health Conditions, Hazards: To quote an official of the Institute of American Meat Packing, "injuries are medium in frequency, and low in severity." Workers are exposed to cuts and bruises because of the extensive use of knives and cutting equipment. When using knives on small pieces of meat or removing bones from the surrounding flesh, workers are expected to use either a meat hook or a wire mesh glove to protect the hand which grasps the sectioned carcass.

These accessories are considered safety devices. All minor accidents must be treated by antiseptic methods promptly, since there is an ever-present danger of infection developing if the skin is broken. Ordinary care, however, is all that is required, and no special precautions are necessary.

Although odor is a factor that is unpleasant, it has no effect on the health of employees; and they eventually become accustomed to it. Attempts are being made to reduce these unpleasant odors to a minimum.

Grease on worker's boots or shoes coming in contact with wet floors increases the hazard of sliding and slipping, making it necessary for workers to exercise care in walking at all times. In certain sections of the plant a large number of heavy hand trucks are constantly being used for moving material and frequently cause congested traffic conditions. So far as can be determined, there are no occupational diseases in this industry.

General Coverage Jobs Pertinent:

- a. Carton Set-up, GC-1
- b. Wrapping and Packaging, GC-2
- c. Material Handling, GC-3
- d. Machine Tending, Feeding, and Off-bearing, GC-6

## SLAUGHTERING AND MEAT PACKING

General Information Sheet (Cont'd)Jobs Usually to be Avoided Although Seemingly Suitable:

- a. Stuffing Machine Operator
- b. Bacon Slicer
- c. Clothier
- d. Grinder (sausage materials)
- e. Pumper (hams, shoulders, and bellies)

Combination Jobs: (Jobs often combined to provide full-time employment)

- a. Leaf-fat Puller  
Loin Wrapper
- b. Sausage Skinner  
Bander  
Packer (sausage)  
Banding Machine Feeder
- c. Linker (hand)  
Tier  
Pan Washer  
"Fast-tie" Machine Operator
- d. Stockinet Man  
Stringer  
Tier  
Ripper  
Stapling Machine Operator  
Parcher  
Packer (hams and bacon)



## SLAUGHTERING AND MEAT PACKING

LEAF-FAT PULLER

1. Name Used for Position in Plant Surveyed: Leaf-fat Puller

D.O.T. Title: Leaf-lard Puller

Code: 8-09.11

Alternate Titles: Lard puller; leaf-fat puller; and leaf puller.

D.O.T. Definition: Grasps with both hands the end of leaf-lard strip (fat which lines the inside of the ribs) and rips strip from carcass with sudden jerk; throws strip into portable truck. May remove kidneys.

Items Worked on in Plant Surveyed: Leaf-fat (hog)

2. Usual Operator:

a. Sex: Male.

b. General Characteristics: Husky, quick and sure in movements; average mental ability.

3. Physical Demands:

a. Activities: Walking, balancing, standing, turning, stooping, reaching, lifting, throwing, pulling, handling, fingering, feeling.

b. Working Conditions: Inside, wet, noisy, adequate lighting and ventilation, moving objects, working around others.

c. Skill Required: Ability to stand all day and work rapidly with hands and arms and to accurately judge distance and location; sufficient tactual perception to differentiate between meat and fat.

4. Details of Physical Activities: Stands all day; keeps balance while standing at edge of platform, stooping slightly and reaching forward about one foot to contact moving carcass; fingers and feels fat to loosen edges of fat from carcass; with a strong jerk pulls backward and toward him to remove fat; turns to throw the fat into lard truck behind him.

## SLAUGHTERING AND MEAT PACKING

LEAF-FAT PULLER

(Cont'd)

5. Details of Working Conditions: Works with others inside in adequately lighted and ventilated room which is damp because of constant flushing of the floor with water, and noisy because of movement of machinery and overhead conveyors; worker wears rubber boots and heavy rubber apron to protect his clothing; hands and arms in particular become dirty because of contact with recently slaughtered carcass.
6. Hazards: There is a possibility of falling from the working platform which is approximately 2 ft. high, 30 inches wide, and is continuous from one working position to the next. The worker safeguards himself by maintaining his orientation through referring to the passing carcasses as he works on them with his hands, locating the forward edge of the platform with the sole of his boot, and contacting the lard chute or truck with his other foot or the lower portion of his leg. The finger nails may be bent backwards in pulling the fat unless they are kept cut short. Scratches from protruding bones may be avoided by a careful and systematic approach to and handling of the carcass.
7. Sequence of Steps in Position in Plant Surveyed:

As the suspended carcass moves slowly past him, the worker:

- a. Reaches forward and with one hand takes hold of the lower part of the leaf while he thrusts the other hand between the leaf and the back of the hog, manipulating the fat with the fingers of both hands until the lower portion is loosened from the ribs;
- b. Holding the lower portion of fat firmly with both hands jerks suddenly upward and outward, completing the separation of the leaf from the carcass;
- c. Turns and throws it into the opening of the chute directly behind him.

NOTE: As the whole leaf is of more value than leaf scraps left on the bellies, care must be taken to remove all of it in one piece.

## SLAUGHTERING AND MEAT PACKING

LEAF-FAT PULLER

(Cont'd)

8. Equipment as Found in the Particular Plant Surveyed:

- a. Identification: Overhead conveyor, disposal chute, and metal grill platform.
- b. Set-up and Maintenance: None
- c. Modification: None

9. Equipment Variations Which May be Found in Other Plants:

Substantially the same in all plants except that in some plants the fat is thrown into a box truck for removal.

10. Usual Pre-employment Training: None11. Usual Training Procedure on the Job: Foreman instructs worker in all steps of the operation.12. Any Training Deviations for the Blind: None13. Production:

- a. Full: 6,000 carcasses a day.
- b. Time to Reach Normal Efficiency: Two to three weeks.

14. Interrelation with Preceding and Succeeding Jobs: This is a line job, and each worker must complete his operation while the carcass is passing by his position.15. Teaming with Other Workers: None16. Modification, Deviation, Special Tools for the Blind: None17. Sight Requirements and Conditions:

- a. Vision Required for the Job: None
- b. Conditions affecting Suitability of a Particular Job:
  - 1. For the Totally Blind: None
  - 2. For the Partially Sighted: The degree of lifting and amount of strain should be approved by an ophthalmologist as being compatible with the client's eye condition.



## SLAUGHTERING AND MEAT PACKING

LEAF-FAT PULLER

(Cont'd)

18. Avoid the Following Conditions: Transfer to other jobs not suitable for performance without the use of sight.
19. Other Jobs Often Combined for Full-Time Employment: If the killing floor crew shifts to the trimming floor, the job of Leaf-fat Puller may logically be combined with that of Loin Wrapper.
20. Industries, Parts of Industries, or Types of Plants Where This Type of Job is Frequently Found:

Slaughtering and meat packing plants where hogs are slaughtered on a production basis.

## SLAUGHTERING AND MEAT PACKING

FRANKFURTER SKINNER

1. Name Used for Position in Plant Surveyed: Frankfurter Skinner

D.O.T. Title: Skin Peeler

Code: 8-09.11

Alternate Titles: Bander; frankfurter skinner; link sausage skinner.

D.O.T. Definition: A Laborer, Byproducts Operation. Changes skin-sausage to skinless by stripping casings (usually cellophane) from it with knife and hands. May place gummed bands around skinned sausage.

Items Worked on in Plant Surveyed: Frankfurters

2. Usual Operator:

a. Sex: Female

b. General Characteristics: Any size; nimble; agile; quick arm, hand, and finger movements; average mental ability.

3. Physical Demands:

a. Activities: Standing, reaching, lifting, pushing, pulling, handling, fingering, feeling, working speed.

b. Working Conditions: Inside, cold, adequate lighting and ventilation, working with others.

c. Skill Required: Unskilled; ability to stand all day and work rapidly with hands and fingers to feel thin cellophane and to accurately nick it with a dull knife without disturbing the material which it covers, to manipulate the fingers while holding three or four frankfurters in one hand and to accurately locate items within arm's reach.

4. Details of Physical Activities: Stands all day and works rapidly with hands and arms; reaching forward pulls stuffed and linked frankfurter casings toward her; handles, fingers, and feels links to peel off the casings.

## SLAUGHTERING AND MEAT PACKING

FRANKFURTER SKINNER

(Cont'd)

5. Details of Working Conditions: Works with others inside in adequately lighted and ventilated room which is cold because of refrigeration.
6. Hazards: It is possible to slightly puncture the hands or fingers with the knife which is used to nick the casings. This hazard is slight because the knife is very dull and the worker learns to handle it accurately and efficiently after a few days.
7. Sequence of Steps in Position in Plant Surveyed:
  - a. Worker reaches toward the center of the work table; secures a string of link-sausage which has been placed there by another worker and pulls it toward her.
  - b. Grasping one link in left hand and, using a small dull knife, cuts the casing between the links, thus separating the frankfurter from the string.
  - c. With one motion, nicks end of the casing with a knife and grips the tip of the casing between the thumb and the blade.
  - d. Simultaneously twists the frankfurter with the left hand and pulls the casing down and off with the right.
  - e. The skinned frankfurters are placed in a box for removal, and the skins are dropped into a refuse box on the floor.

NOTE: Care must be taken not to dig into the meat, as this leaves a bad appearance and affects its salability. Occasionally this worker places printed gummed paper bands around the frankfurters and also packs them neatly into boxes.

8. Equipment as Found in the Particular Plant Surveyed:
  - a. Identification: Group work table, nicking knife, refuse box, and tote box for skinned sausages.
  - b. Set-up and Maintenance: None
  - c. Modification: None



## SLAUGHTERING AND MEAT PACKING

FRANKFURTER SKINNER (Cont'd)9. Equipment Variations Which May be Found in Other Plants:

Substantially the same in all plants, except that small cardboard containers may be used instead of tote boxes for receiving skinned frankfurters.

10. Usual Pre-employment Training: None11. Usual Training Procedure on the Job: Supervisor instructs new worker in all steps of the operation. Additional coaching may be given by experienced co-workers.12. Any Training Deviations Suggested for the Blind: None13. Production:

a. Full: Seventy-five to one hundred pounds per hour depending on size and packing requirements.

b. Time to Reach Normal Efficiency: Three to six weeks.

14. Interrelation with Preceding and Succeeding Jobs: None15. Teaming with Other Workers: None16. Modification, Deviation, Special Tools for the Blind: In some plants the workers take turns in obtaining supplies of frankfurters, which serves to break the monotony of the skinning operation. If the blind person is unable to do this, she continues skinning when her turn comes. The other workers usually welcome the additional diversion.17. Sight Requirements and Conditions:

a. Vision Required for the Job: None

b. Conditions affecting the Suitability of a Particular Job:

1. For the Totally Blind: No travel to obtain and dispose of material.

2. For the Partially Sighted: Travel requirements for the obtaining or disposal of material should be compatible with the type and amount of the worker's vision.

## SLAUGHTERING AND MEAT PACKING

FRANKFURTER SKINNER

18. Avoid the Following Conditions: Transfer to other jobs which are not suitable for performance without the use of sight.
19. Other Jobs Often Combined for Full Time Employment: Bander, packer, weigher, banding machine operator, pan washer.
20. Industries, Parts of Industries, or Types of Plants Where This Type of Job is Frequently Found:

In the sausage-making departments of meat packing plants and in concerns specializing in the production of smoked meats and sausages.

## SLAUGHTERING AND MEAT PACKING

SAUSAGE LINKER

1. Name Used for Position in Plant Surveyed: Sausage Linker

D.O.T. Title: Linker

Code: 8-09.11

Alternate Titles: Benchman; linker man; roper; sausage linker; sausage twister.

D.O.T. Definition: A Laborer, Byproducts Operation. Twists "ropes" of sausage into links of specified length; sets sausage gage according to length specified by foreman; ties one end of stuffed sausage casing with twine to prevent contents spilling out; measures length of sausage on gage, starting at tied end of casing, and presses casing between thumb and index finger at end of measured length; twirls sausage to twist casing at pressed section, forming a link; measures out and twirls remaining length of stuffed casing to make additional links; may tie together two ends of stuffed casings to make a longer string of linked sausages; cuts away defective portions of casings with knife and ties short lengths together. May drape sausages around sticks for subsequent handling.

Items Worked on in Plant Surveyed: Sausage

2. Usual Operator:

a. Sex: Female

b. General Characteristics: Alert, agile, nimble fingers, quick hand movements, average mental ability.

3. Physical Demands:

a. Activities: Standing, turning, reaching, lifting, carrying, handling, fingering, feeling, pulling, working speed.

b. Working Conditions: Inside, cold, wet, dirty, noisy, adequate lighting and ventilation, works around others.



## SLAUGHTERING AND MEAT PACKING

SAUSAGE LINKER

(Cont'd)

- c. Skill Required: Unskilled, ability to use the fingers quickly and deftly in the twisting of sausage links, to accurately locate articles which are within arm's reach, to remember the location of objects so that they may be located without groping.
4. Details of Physical Activities: Stands all day; reaches to obtain stuffed sausage casings; pulls, handles, fingers, and feels the casings to twist them into links; carries strings of linked sausage weighing up to five pounds from one to ten feet; lifts strings of sausage to a maximum height of six feet to drape them over the bars of smoking trees.
5. Details of Working Conditions: Works around others inside in adequately lighted and ventilated area; cold because of refrigeration; wet because of wash water on tables and floors; dirty because of the continual handling of meat and casings; noisy because of the operation of near-by machinery.
6. Hazards: There is practically no hazard connected with this job except that the worker might receive a slight cut from the use of a knife in cutting strings and casings. Also the combination of wet floors and greasy shoes may result in the worker's slipping. The remedy for both of these hazards is extreme care on the part of the worker.
7. Sequence of Steps in Position in Plant Surveyed:
- Operator:
- a. Picks up a filled casing as it is ejected from a Sausage Stuffing Machine and ties it with cord;
- b. Gauges a link by placing the end even with the left edge of the gauge and pinching the casing at the right end of the gauge;
- c. Gauges a second link by transferring the first pinch to the left side of the gauge and making a pinch at the right side;

## SLAUGHTERING AND MEAT PACKING

SAUSAGE LINKER

(Cont'd)

- d. Quickly flips the portion between the fingers so as to twist at the pinches and form a link;
- e. Measures, pinches, and twists the remaining length of the casing to form it into uniform length sausage links;
- f. When the end of the casing is reached, ties the end of a new casing to it and continues to link until ten or fifteen feet of links have been made;
- g. Drapes these links over the arm and carries them to a rack which is located from one to ten feet from the work bench;
- h. Drapes the links over poles so that they hang in loops and do not touch one another;
- i. The racks are removed by another worker.

NOTE: Extreme care must be used while linking sausages, as the casings are very tender; and if too much pressure is placed on the walls, the sausage meat will break through. When casings are tied together, the loose ends are tied close to the knots. Hand linkers are fast being replaced by linking machines; nevertheless, it will be some time before the operation is obsolete.

8. Equipment as Found in the Particular Plant Surveyed:

- a. Identification: Work table, measuring gauge, trees for hanging, and small knife.
- b. Set-up and Maintenance: None
- c. Modification: None

9. Equipment Variations Which May be Found in Other Plants:

Substantially the same in all plants.

10. Usual Pre-employment Training: None

## SLAUGHTERING AND MEAT PACKING

SAUSAGE LINKER

(Cont'd)

11. Usual Training Procedure on the Job: Supervisor instructs worker in all steps of the operation.
12. Any Training Deviations Suggested for the Blind: None
13. Production:
  - a. Full: Ninety to 100 pounds an hour.
  - b. Time to Reach Normal Efficiency: Three to six weeks.
14. Interrelation with Preceding and Succeeding Jobs: Worker must not allow filled casings coming from the stuffing machine to pile up.
15. Teaming with Other Workers: Two workers often team together to hang the linked sausage on the trees.
16. Modification, Deviation, Special Tools for the Blind: None
17. Sight Requirements and Conditions:
  - a. Vision Required for the Job: None
  - b. Conditions affecting Suitability of a Particular Job:
    1. For the Totally Blind: No travel outside of the immediate work area to dispose of materials.
    2. For the Partially Sighted: Travel requirements must be compatible with the client's type and amount of vision.
18. Avoid the Following Conditions: Transfer to other jobs not suitable for performance without the use of sight.
19. Other Jobs Often Combined for Full Time Employment: Tier, pan washer.



SLAUGHTERING AND MEAT PACKING

SAUSAGE LINKER

(Cont'd)

20. Industries, Parts of Industries or Types of Plants Where This Type of Job is Frequently Found:

In the sausage making departments of large meat packing plants and in concerns specializing in the production of smoked meats and sausage.



## SLAUGHTERING AND MEAT PACKING

BOLOGNA TIER

1. Name Used for Position in Plant Surveyed: Bologna Tier  
D.O.T. Title: Bulk-Sausage-Casing Tier-Off  
Code: 8-09.11  
Alternate Titles: Casing tier; stuffed-casing-tier; tier  
D.O.T. Definition: None  
Items Worked on in Plant Surveyed: Bologna
2. Usual Operator:
  - a. Sex: Female
  - b. General Characteristics: Any size, nimble, strong fingers, average mental ability.
3. Physical Demands:
  - a. Activities: Standing, turning, reaching, lifting, handling, fingering, feeling.
  - b. Working Conditions: Inside, cold, wet, adequate lighting and ventilation, works around others.
  - c. Skill Required: Unskilled; ability to tie knots in cord while holding tension on one end; to locate articles within arm's reach quickly and accurately and to cut light cord safely with a knife.
4. Details of Physical Activities: Stands all day at work table; turns and reaches to obtain and dispose of filled bologna casings; lifts single casings weighing from one to five pounds; handles, fingers, and feels the casing and light cord to close the open end.
5. Details of Working Conditions: Works around others inside in adequately lighted and ventilated room which is cold because of refrigeration and the floors of which are wet because of frequent flushing of the work area.



## SLAUGHTERING AND MEAT PACKING

BOLOGNA TIER

(Cont'd)

6. Hazards: The worker uses a dull knife with which to cut the cord that is used to tie the casings shut. While there is a possibility of a slight laceration from this knife, the risk is slight.
7. Sequence of Steps in Position in Plant Surveyed:
  - a. Operator stands at work table and reaches to left to obtain a stuffed bologna casing from a box which has been placed there by another worker.
  - b. Grasps the casing with the right hand and, working from the open end back, holds it closed with the fingers,
  - c. With the left hand, picks up the ends of a double thickness of cord and wraps it around the casing between the fingers of the right hand and the stuffed portion of the casing.
  - d. Using both hands, ties a half-hitch in the cord as close to the stuffed portion of the casing as possible, leaving six-inch loose length of string. (This step is facilitated as tension is held in the cord by a "tension holder" through which the string feeds).
  - e. Brings string around and ties a second half-hitch on the opposite side of the casing.
  - f. Picks up knife and cuts the supply string approximately six inches from the casing.
  - g. Using a square knot ties the ends together, thus forming a loop by which to hang the bologna during the drying and smoking processes.
  - h. Places the closed casing in box at right for removal.

NOTE: In some plants the operators are not required to make a loop in the string, in which case it is cut off close to the casing. Workers may also be required to make a similar tie at one end of empty casings in order to make them ready for use by the stuffers.

## SLAUGHTERING AND MEAT PACKING

BOLOGNA TIER

(Cont'd)

8. Equipment as Found in the Particular Plant Surveyed:
  - a. Identification: Work table, small knife, tension holder.
  - b. Set-up and Maintenance: None
  - c. Modification: None
9. Equipment Variations Which May be Found in Other Plants:

Substantially the same in all plants.
10. Usual Training Procedure on the Job: Supervisor instructs worker in all steps of the operation.
11. Usual Training Procedure on the Job: Supervisor instructs worker in all steps of the operation.
12. Any Training Deviations Suggested for the Blind: None
13. Production:
  - a. Full: 250 to 350 an hour.
  - b. Time to Reach Normal Efficiency: Two to four weeks.
14. Interrelation with Preceding and Succeeding Jobs: Stuffed casings come from the stuffing machine where they have been filled and are removed for drying and smoking. Although it is not necessary to keep exact pace with the stuffing machine operator, the worker must keep up with the output.
15. Teaming with Other Workers: None
16. Modification, Deviation, Special Tools for the Blind: None

## SLAUGHTERING AND MEAT PACKING

BOLOGNA TIER

(Cont'd)

17. Sight Requirements and Conditions:
- a. Vision Required for the Job: None
  - b. Conditions affecting Suitability of a Particular Job:
    - 1. For the Totally Blind: No travel to obtain or dispose of materials.
    - 2. For the Partially Sighted: Travel to obtain and dispose of materials should be compatible with the client's type and amount of vision.
18. Avoid the Following Conditions: Transfer to other jobs which are not suitable for performance without the use of sight.
19. Other Jobs Often Combined for Full-time Employment: Linker, Fast-tie Operator.
20. Industries, Parts of Industries or Types of Plants Where This Type of Job is Frequently Found:
- In the sausage making departments of large meat packing plants and in concerns specializing in the production of smoked meats and sausage.



## SLAUGHTERING AND MEAT PACKING

FAST-TIE OPERATOR

1. Name Used for Position in Plant Surveyed: Fast-Tie Operator

D.O.T. Title: None

Code: 8-09.11

Alternate Title: None

D.O.T. Definition: None

Items Worked on in Plant Surveyed: Synthetic cellophane  
bologna casings.

2. Usual Operator:

a. Sex: Female

b. General Characteristics: Any size, alert, nimble, quick  
hand movements, average mental ability.

3. Physical Demands:

a. Activities: Sitting, reaching, pushing, pulling, handling,  
fingering, feeling, working speed.

b. Working Conditions: Inside, adequate lighting and venti-  
lation, mechanical hazards, works around others.

c. Skill Required: Unskilled; ability to recognize shape and  
contour of small objects by touch, to accurately locate  
fixed positions within arm's reach, and to hold the  
pleated end of a synthetic casing in one hand, insert  
it into the hole of a quarter-inch metal sleeve, and  
to coordinate the movements of the hands and feet.

4. Details of Physical Activities: Sits all day; reaches to secure  
synthetic casings and sleeves and to dispose of "tied"  
casings; places them into power press to form pleats at  
end; pulls casing and fingers it to hold pleats in place  
over end; inserts the assembly into another position on the  
machine; depresses foot treadle to actuate machine.

## SLAUGHTERING AND MEAT PACKING

FAST-TIE OPERATOR

(Cont'd)

5. Details of Working Conditions: Works with others inside in adequately lighted and ventilated room; mechanical hazards due to operation of air-powered press.
6. Hazards: The operator is exposed to the hazard of pinching the hand or finger in the die of the press; however, the hazard is reduced because the operator controls the motion of the press with a foot pedal. The approach to the machine should be from the bottom so that the fingers or hands will first contact the lower portion of the lower die which is stationary. Using this as a reference point and by making sure that the foot pedal is not depressed while the fingers are near the jaws of the die, the operator will be safe.
7. Sequence of Steps in Position in Plant Surveyed:
  - a. Operator picks up a synthetic casing with her left hand, inserting it between the jaws of the "pleating die" at the left side of the machine.
  - b. When she is sure that her hands are well away from the edge of the die, depresses and holds down foot pedal, closing the die to grip the end of the casing and start the formation of the pleats.
  - c. With the right hand, stretches the casing toward her.
  - d. With the left hand, grasps the "pleated casing" close up to the die, holding the pleats together between the thumb and first finger. Opens the die by removing her foot from the pedal.
  - e. Removes the casing; grasps the tip with the fingers of the right hand and pulls to set the pleats.
  - f. Secures metal sleeve with right hand from bin at right and inserts pleated tip of casing into it, making sure that the collar of the sleeve is toward the center of the casing and that the tip extends at least one-fourth inch beyond the end of the sleeve.

## SLAUGHTERING AND MEAT PACKING

FAST-TIE OPERATOR (Cont'd)

- g. Making sure that the sleeve remains in its proper position on the casing, slips its collar into the slot of the crimping die, thus positioning the sleeve for crimping.
- h. While keeping the hands away from the die, yet supporting the casing in the proper position with the right hand, depresses and releases foot treadle actuating the machine, crimping the sleeve to the casing.
- i. Removes the "tied casing" and places it into a box at right for removal by another worker.

NOTE: There are several sizes of casings and three different size sleeves to fit them. When the size of the casing is changed, different dies must be placed into the press to accommodate the change in size.

8. Equipment as Found in the Particular Plant Surveyed:

- a. Identification: Hercules Air Press (two-position); bins for synthetic casing, sleeves, and completed casings; chair for worker.
- b. Set-up and Maintenance: Dies are changed and adjustments are made by a maintenance man.
- c. Modification: None

9. Equipment Variations Which May be Found in Other Plants:

Substantially the same in all plants.

- 10. Usual Pre-employment Training: None
- 11. Usual Training Procedure on the Job: Supervisor instructs new worker in all steps of the operation.
- 12. Any Training Deviations Suggested for the Blind: The blind worker should be taught to approach the machine at the bottom portion of the lower die and to use it as a reference point in order that her fingers may be kept away from the jaws when they are brought together.



## SLAUGHTERING AND MEAT PACKING

## FAST-TIE OPERATOR (Cont'd)

13. Production:

- a. Full: 550 to 650 an hour
- b. Time to Reach Normal Efficiency: Two to four weeks.

14. Interrelation with Preceding and Succeeding Jobs: Although this job is not directly linked to the next one, steady production must be maintained.15. Teaming with Other Workers: None16. Modification, Deviation, Special Tools for the Blind: None17. Sight Requirements and Conditions:

- a. Vision Required for the Job: None
- b. Conditions affecting Suitability of a Particular Job:
  - 1. For the Totally Blind: No travel outside the immediate work area to obtain and dispose of materials.
  - 2. For the Partially Sighted: Travel outside the work area to obtain and dispose of materials must be compatible with the client's type and amount of vision.

18. Avoid the Following Conditions: Transfer to jobs not suitable for performance without the use of sight.19. Other Jobs Often Combined for Full-time Employment: Tier20. Industries, Parts of Industries or Types of Plants Where This Particular Job is Frequently Found:

In the sausage-making departments of meat packing plants and in concerns specializing in the production of smoked meats and sausage.

## SLAUGHTERING AND MEAT PACKING

STOCKINETER

1. Name Used for Position in Plant Surveyed: Stockineter

D.O.T. Title: Stockinet Man

Code: 8-09.11

Alternate Titles: Stockinet holder, washroom; stockinet tier, washroom.

D.O.T. Definition: A Laborer, Byproducts Operation. Places cured meats in cloth sacks for ease in handling during smoking or storage: Places hams, cured necks, Canadian bacon, or other cured meats in stockinets (loosely woven cloth sack); ties knot in open end of stockinet, making a loop for hanging. May insert stick through stockinets and hang them on rack. Sometimes specifically designated according to kind of meat handled, as Canadian-Bacon-Stockinet Wrapper.

Items Worked on in Plant Surveyed: Hams

2. Usual Operator:

a. Sex: Male (female occasionally)

b. General Characteristics: Any size, strong, quick hand and arm movements, average mental ability.

3. Physical Demands:

a. Activities: Standing, turning, reaching, lifting, pushing, pulling, handling, fingering, feeling.

b. Working Conditions: Inside, humid, wet, adequate lighting and ventilation, works around others.

c. Skill Required: Unskilled, ability to handle pieces of meat weighing from five to twenty-five pounds all day long; to manipulate loosely woven cloth sacks and quickly roll them up loosely.

## - SLAUGHTERING AND MEAT PACKING

STOCKINETER

(Cont'd)

4. Details of Physical Activities: Stands all day; turns to obtain empty stockinet; reaches from one to three feet to obtain and dispose of meat; lifts pieces of meat weighing from five to twenty-five pounds; pushes, pulls, handles, fingers, and feels pieces, and the stockinet, in order to get in over the meat; fingers and feels end of stockinet to tie knot.
5. Details of Working Conditions: Works around others inside in adequately lighted and ventilated room which is humid because of the washing process. Floors are wet because of frequent flushing.
6. Hazards: None
7. Sequence of Steps in Position in Plant Surveyed:
  - a. Reaches to his left and picks up a ham from the work bench where it was placed by another worker and places it in front of him.
  - b. Picks up a stockinet (loosely woven cloth bag) from a bin at his left, rolling it up loosely and stretching it slightly.
  - c. Places stockinet over butt end of ham and unrolls it, stretching and smoothing as he works until the ham is completely incased.
  - d. Ties a knot in the end of the stockinet.
  - e. Lifts the stockineted ham and places it on the far side of the work bench for removal by another worker.

NOTE: This worker places stockinets on hams, shoulders, butts, necks, and Canadian bacon. In some plants the end of the stockinet is not tied, in which case another worker bunches the end of the stockinet and places a staple into it. (Frequently, this worker is expected to participate in cleaning of the washroom, meat trees, and smoke houses). In some plants the stockinet man places the stockinets over



## SLAUGHTERING AND MEAT PACKING

STOCKINETER

(Cont'd)

a horn (wide, funnel-like metal apparatus) which is large enough to take up to a twenty-five-pound ham. A "thrower" throws the meat into it. The impact forces the jaws open, allowing the meat to drop into the stockinet.

8. Equipment as Found in the Particular Plant Surveyed:
  - a. Identification: Work bench and bin for holding stockinets.
  - b. Maintenance: None
  - c. Modification: None
9. Equipment Variations Which May Be Found in Other Plants: The meat may be brought to the worker on a conveyor belt and taken from him by the same method. A horn is used in many plants.
10. Usual Pre-employment Training: None
11. Usual Training Procedure on the Job: Supervisor instructs worker in all steps of the operation.
12. Any Training Deviations Suggested for the Blind: None
13. Production:
  - a. Full: 400 to 500 an hour depending on the size of the pieces of meat and the method used.
  - b. Time to Reach Normal Eddiciency: Two to four weeks.
14. Interrelation with Preceding and Succeeding Jobs: The meat comes from the brander end, after being stockineted, is hung on trees and taken to the smoke house. When meat is supplied by conveyors, it is necessary to keep pace with the other workers on the line.
15. Teaming with Other Workers: When a horn is used, a "thrower" and one or two stockinet men work as a team.
16. Modification, Deviation, Special Tools for the Blind: None

## SLAUGHTERING AND MEAT PACKING

STOCKMETER

(Cont'd)

17. Sight Requirements and Conditions:a. Vision Required for the Job: Noneb. Conditions affecting Suitability of a Particular Job:

1. For the Totally Blind: No responsibility for clean-up.
2. For the Partially Sighted: Clean-up responsibility must be compatible with the client's type and amount of vision.

18. Avoid the Following Conditions: Transfer to other jobs which are not suitable for performance without the use of sight.19. Other Jobs Often Combined for Full-Time Employment: Sticker, Stapler, Cellophane Tied.20. Industries, Parts of Industries or Types of Plants Where This Type of Job is Frequently Found:

In the sausage making departments of large meat packing plants and in concerns specializing in the production of smoked meats and sausage.

DEPARTMENT OF  
HEALTH, EDUCATION, AND WELFARE  
Office of Vocational Rehabilitation  
Washington 25, D. C.

September 14, 1953

REHABILITATION SERVICE SERIES NUMBER 58 - SUPPLEMENT 16

To: Divisions of Vocational Rehabilitation (in States with no separate agency for the Blind); Commissions and Other Agencies for the Blind.

Subject: Supplement to Handbook of Representative Industrial Jobs for Blind Workers - Category SI-7, Sleeve Presser

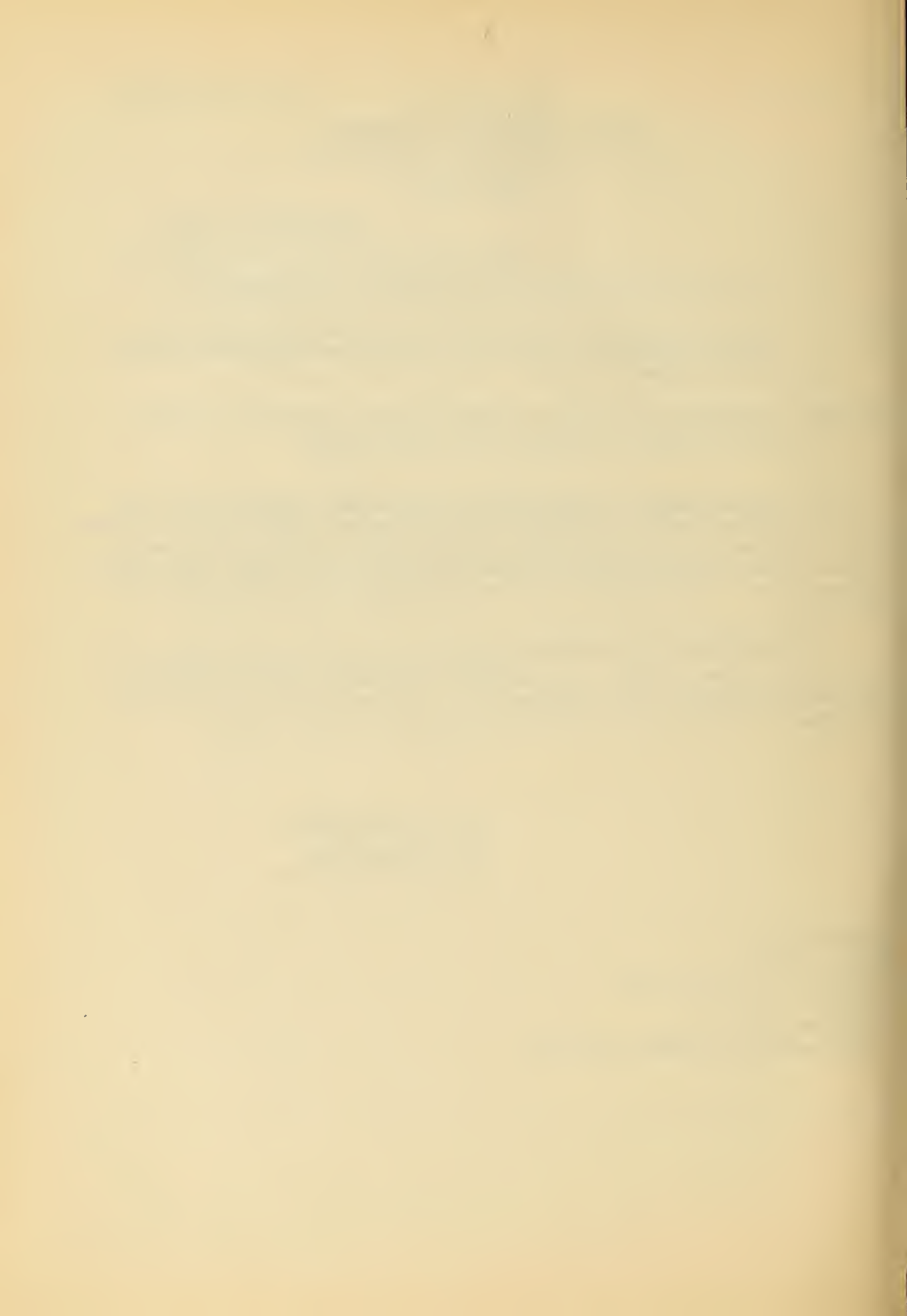
The attached job description in the garment industry is to be inserted in the Handbook of Representative Industrial Jobs for Blind Workers as an additional job to the seventh category, Part I, Specific Industries Series. Like the jobs already issued in this category it has been observed and tested by a blind member of the staff of the section of Services for the Blind.

Additional copies of the Handbook or any of its supplements will be furnished upon request. We trust that this material will be helpful and would appreciate any suggestions for improvement which you might have to offer.

*D. H. Dabelstein*  
D. H. Dabelstein  
ASSISTANT DIRECTOR

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## GARMENT INDUSTRY

SLEEVE PRESSER

1. Name Used for Position in Plant Surveyed: Sleeve Presser

D.O.T. Title: Presser, Machine

Code: 7-57.511

Alternate Titles: Cylinder-press operator; finisher, machine; flattening-machine operator; pressing-machine operator; press operator; steam operator; steam-heated-power-press operator; steam presser; steam-press operator.

D.O.T. Definition: Smooths the surfaces of garments, drapes, slip covers, and other shaped fabric articles with a pressing machine to shape the articles, to remove wrinkles, and to flatten seams. Spreads part of article on padded table (buck) of machine. Pulls top half (pressing head) of machine down over buck, locking head in place. Depresses pedal to create vacuum, exhausting steam from press and drying article. Opens press and rearranges article, repeating until required pressing has been done. May operate two presses, loading one while the other is closed. May be designated according to the garment or part of garment worked on, as armhold-and-shoulder off-presser; band presser; coat presser; collar fuser; curtain and drapery presser; linen presser; men's garment presser; pants presser; shirt finisher; sleeve-and-shoulder presser; vest-front presser; wash-clothes presser; wool presser.

Items Worked on in Plant Surveyed: Men's coats

2. Usual Operator:

a. Sex: Male

b. General Characteristics: Any size, nimble, quick and steady, and with average mental ability. Temperament suited for rapid, continuous machine operation. Not sensitive to heat given off by steam press.

3. Physical Demands:

a. Activities: Walking, standing, turning, reaching, carrying, fingering, handling, feeling.

b. Working Conditions: Inside, humid, hot, odorous, noisy, adequate lighting, adequate ventilation, works around others.

c. Skill Required: Semi-skilled. It is essential that the operator: have good hand and foot coordination as both feet and hands are used concurrently; be skillful in using the hands to pull the head of the machine down on the material which has been placed on the the buck; with his foot, hold the head against the material without

SLEEVE PRESSER (Contd.)

locking and with the right hand pull the steam lever which permits air to flow through the buck and remove the shine from the material being pressed.

4. Details of Physical Activities: The worker may stand at his machine all day. Walks a distance of about three or four feet, continually turns and reaches to secure and dispose of garments, pushes and pulls levers and steps on pedals to operate the pressing machine; and controls the flow of steam and air through pressing buck.
5. Details of Working Conditions: Works inside around others in adequately lighted and ventilated area which is hot and humid because of escaping steam. Because of the extreme heat from the steam press, the operator should wear light clothing.
6. Hazards: Worker is exposed to burns from steam or from contact with the pressing head of the machine. These hazards can be reduced to a minimum if worker is taught to follow a definite pattern of safety for his movements throughout the pressing cycle. This pattern should include a method of approaching the machine safely whether the steam is on or off, or whether the pressing head is up or down; a method of following safe paths from the original safe point of contact to all the controls; and a method of safely determining whether there is steam in the press. This can usually be accomplished if the worker will approach the machine with his hands at his side, slightly ahead of him and with the backs toward the machine; thus the back of the hand will first touch the pressing table. He may then locate the center of the machine by finding the center notch in table, and by feeling for the foot pedals with his feet. Safe paths to and from the various controls will vary with the make and model of the pressing machine.
7. Sequence of Steps in Position in Plant Surveyed:
  - a. Worker faces bar holding men's coats. With right hand takes hanger holding coat from bar, removes coat from hanger with left hand and places hanger on to bar with right hand; makes a complete turn, walks to machine and lays coat on to apron of machine.
  - b. Picks up sleeve of coat and pulls over buck of machine with the inside crease of sleeve centering the buck.
  - c. With left hand reaches and grasps handle on head of machine and pulls it down toward buck; with right foot steps on center pedal and locks head down to buck; with right hand grasps and pulls steam lever which is located in the center of the head, and holds for an instant to release steam; with right foot steps on right pedal at the right of center pedal to release locked head; with left foot steps on vacuum pedal at left of center to dry pressed material.



## GARMENT INDUSTRY

SLEEVE PRESSER (Contd.)

- d. Takes damp cloth in hands and places over pressed material, repeats the previous operation without locking the pedal to the buck. With the right foot on the center pedal, holds the head to the material being pressed. Again apply steam from the head, release, then dry material by stepping on vacuum pedal which is located at the left of center pedal. The second operation is to remove shine from material caused by first pressing which was to remove a pressed crease. This process is repeated with the second sleeve; worker then turns and walks to bar holding coat by the neck with left hand; removes hanger from bar with right hand, puts it into coat, hangs it back on the bar, and pushes it to the right for another operator, who is not more than two feet away.
3. Equipment as Found in the Particular Plant Surveyed:
- a. Identification: Sleeve Pressing Machine using live steam in head only.
- b. Set-up and Maintenance: All set-up and maintenance is performed by a maintenance man.
- c. Modification: None.
9. Equipment Variations Which May be Found in Other Plants: The only variation is in the type of machine used. The sequence of work steps is the same regardless of the type of machine used.
0. Usual Pre-Employment Training: Training is usually received through:
- a. A course in a vocational school
- b. Work as an apprentice in a cleaning and dyeing establishment.
- c. Through observation of other workers.
- d. Step by step instruction of a supervisor
1. Usual Training Procedure on the Job: The foreman usually instructs the worker in the operations of the machine as well as methods of handling the materials to be pressed.
2. Any Training Deviations Suggested for the Blind: It would be advisable to provide training in a local pressing establishment, or a vocational school, where the trainee could become familiar with the pressing machine and its various controls. During this period he should also be taught to follow a pattern for safe operation, in order to avoid burns which could easily be received from contact with the heated portion of the machine.

SLEEVE PRESSER (Contd.)13. Production:

a. Full: 50 coats per hour.

b. Time to Reach Normal Efficiency: An experienced worker may come up to full production in one to three hours. An inexperienced worker, starting on a simple operation, may take as long as six weeks to reach full production and efficiency.

14. Interrelation with Preceding and Succeeding Jobs: This pressing operation is only one of several pressing operations done on the same coat. Each worker operates a different type of press designed to press different parts of the coat; therefore, the operator must handle all the garments that come to him in order that he will not hold up the production of the worker performing the succeeding operation.

15. Teaming with Other Workers: None

16. Modification, Deviation, Special Tools for the Blind: None

17. Sight Requirements and Conditions:

a. Vision Required for the Job: None

b. Conditions Affecting Suitability of a Particular Job:

1. For the Totally Blind: His work should be checked by a sighted person to make sure that all shine has been removed from the material.

2. For the Partially Sighted: Lighting and degree of heat should be compatible with the worker's type and amount of vision.

18. Avoid the Following Conditions: Tallying of time sheets.

19. Other Jobs Often Combined for Full-Time Employment: This job might be combined with job of creasing sleeves in a small plant, to make a full-time job.

20. Industries, Parts of Industries, or Types of Plants Where This Type of Job is Frequently Found: Clothing manufacturers - usually the ones which manufacture men's suits and coats.

DEPARTMENT OF  
HEALTH, EDUCATION, AND WELFARE  
Office of Vocational Rehabilitation  
Washington 25, D.C.

June 30, 1954

REHABILITATION SERVICE SERIES NUMBER 52 - APPENDIX C

TO: Divisions of Vocational Rehabilitation; Commissions and other  
Agencies for the Blind

SUBJECT: Appendix C, "Methods Used by Blind Persons in Detecting Signs  
and Symptoms of Diseases and Common Ailments in Poultry,"  
Handbook of Job Descriptions in Rural Activities Suitable for  
the Employment of Blind Persons

The attached material is to be inserted as Appendix C  
to the Handbook of Job Descriptions in Rural Activities Suitable  
for the Employment of Blind Persons.

The question, "How blind persons can detect signs of  
approaching trouble in time to prevent a serious outbreak of  
disease in their flocks," has arisen with the increasing number  
of persons without sight engaged in poultry raising.

A blind staff member of Services for the Blind, in  
cooperation with a successful blind poultryman, a county agri-  
cultural agent, and a specialist from the U.S. Department of  
Agriculture, has prepared this material with the hope that it  
will aid counselors who have blind clients engaged in the  
raising of poultry.

*M. I. Tynan*

M. I. Tynan, Chief  
Services for the Blind

Attachment

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HANDBOOK OF  
JOB DESCRIPTIONS IN RURAL ACTIVITIES  
SUITABLE FOR THE EMPLOYMENT OF BLIND PERSONS

APPENDIX C

METHODS USED BY BLIND PERSONS IN DETECTING SIGNS AND SYMPTOMS OF  
DISEASES AND COMMON AILMENTS IN POULTRY

To obtain accurate information on conditions which are warning signals of approaching trouble, contacts were made with poultry growers, both blind and sighted; county agricultural agents; veterinarians; and pathologists from the United States Department of Agriculture.

Whether blind or sighted, it is vitally important that poultry growers be able to detect the first signs of disease in their flocks, in order that treatment may be administered to prevent the outbreak from becoming widespread and financial loss serious. The actions of a bird indicate the condition of its health, good or bad, and can be detected without the use of sight. Blind persons, themselves, who carefully observe the bird's actions and behavior, can recognize any significant changes in time to call for assistance from a veterinarian.

Naturally, totally blind persons and persons with seriously impaired vision have difficulty in detecting the symptoms of certain kinds of illnesses and must rely, to some extent, upon sighted help for information. It is for this reason that arrangements should be made for someone, such as a sighted member of the family, a neighbor, or a supervisor provided by a feed dealer, to look the flock and premises over at frequent intervals, and advise the blind person regarding their condition. In all instances, even though sighted assistance is provided, the services of the county agricultural agent are of vital importance. Arrangements should be made for the agent to make regular inspection tours and advise the blind operator regarding the condition of his flock, in order that he may follow the best practices and use the proper methods to prevent disease.

I. CONDITIONS OF A HEALTHY BIRD

Healthy birds are alert and active; they cheep, chatter, cluck, cackle, scratch for food, eat well, run and jump to catch insects, and fly at the slightest disturbance.

When healthy birds are picked up and examined, they are gentle and submissive; their bodies are found to be well formed, full and plump, with a well developed breast and firm flesh; the beaks show no indications of swelling; combs and wattles are free from any abnormal abrasions, nodules, or protuberances; no swollen places will be found around the face; no tears are emitted from the eyes; feathers

APPENDIX C (Contd.)

over the body feel clean, firm, and free from filth and pastiness in the area of the vent; legs are normal, free from scales, with no twistings or distortions; and there is no offensive odor which is distinctive from the regular poultry smell.

In laying flocks, hens that are active producers have enlarged abdomens, soft pliable skin, moist vents, and 2 or 3 fingers can be placed between the pin bones.

II. CONDITIONS AND WARNING SIGNALS OF APPROACHING TROUBLE

In the raising of poultry, there are three definite conditions which are warning signals that indicate approaching trouble and can be identified by sound or touch.

A. Inactivity

The absence of any of the traits or conditions, mentioned under Section I--Conditions of a Healthy Bird, is an indication of approaching trouble, and can be detected by sound or touch.

It is difficult, of course, to detect these symptoms in a few birds when a person is attending a large flock. However, it is the experience of blind poultrymen that, even when a few birds become inactive, fail to respond to fright, and squat listlessly in the pen (occasionally, heavy producing birds will squat at the touch of the foot during mating season), they are usually located by the attendant touching them with his feet. With these warning signals, a blind person will know to call the county agricultural agent, or a veterinarian, to analyze the difficulty and administer such treatment as may be necessary to prevent, or at least lessen the seriousness of disease in the flock.

B. Decrease in Feed Consumption

Good poultrymen carefully weigh and apportion the quantity of feed to be consumed daily by their flocks. When the birds fail to eat all of the feed, it is an indication of approaching trouble. The blind poultryman, of course, easily detects this condition by running his hand into the hopper containing the feed.

One county agricultural agent has the following to say:

"Feed consumption usually drops one or two days before outward symptoms of sickness are noticeable. By measuring out just the right amount of feed needed each day and placing it in the feed hoppers early each morning, a blind person



APPENDIX C (Contd.)

will know that there is something wrong with his flock if any feed is left in the feeders from the day before. He can then call the county agricultural agent or someone else to immediately make an early diagnosis, so that remedial action can be taken before the trouble reaches an advanced stage or gets completely out of control. A person with sight will often wait until he sees outward symptoms of trouble before taking action. Sometimes this is rather late."

A representative of a large feed concern, who is an authority on the raising of broilers, has this to say:

"By keeping daily records of feed consumption, you can notice a decline as soon as it appears. This is a definite sign that something is wrong. Correcting a problem in its development is much easier than suddenly to find out your flock is 'off feed' and a serious respiratory outbreak is affecting the growth and uniformity of your broilers."

C. Falling Off of Egg Production in the Laying Flock

Progressive poultrymen, whether blind or sighted, keep close records of egg production. A falling off in the daily count indicates two conditions: (1) hens may be diseased or plagued with parasites; or (2) hens may be broody or going into a molt. After a season of heavy production a good layer has a rough unkempt plumage, and a poor layer has a clean smooth coat of feathers. Blind poultrymen can easily detect these conditions by examining the plumage of the hens with their hands.

III. EXAMPLES OF DISEASES, PESTS, AND COMMON AILMENTS IN POULTRY, THEIR SIGNS AND SYMPTOMS WHICH CAN BE DETECTED BY TOUCH, SOUND, SMELL, AND A COMBINATION OF THESE METHODSA. Touch

Many ailments in poultry are detectable by touch. Approaching trouble is apparent when the birds droop, are lame, squat, are listless, remain under foot, show a decrease in egg production, have a smooth glossy touch to their feathers, or there is a discharge from infected areas.

To keep themselves acquainted with the actions and conditions of the birds, alert poultrymen make daily checks of their flocks. Whether blind or sighted, they rely heavily on all the senses for information, although the sense of touch probably gives the most accurate picture of the development and condition of a bird.

APPENDIX C (Contd.)

When a poultryman's attention has been attracted by an unusual action, sound, or unfamiliar behavior on the part of a bird in the flock, he involuntarily picks up the bird and makes an examination. Careful inspection of the bird from head to foot will reveal the presence of certain conditions which indicate specific illnesses as follows:

Abrasions, nodules, or protuberances on comb and wattle -- Fowl Pox

Swollen conditions on one or both sides of beak -- Canker

Swollen eyes -- Roup

Secretion from eyes or nostrils -- Cold

Head hanging with neck limp or twisted -- Limberneck or Leukosis

Distorted head posture (tends to bend backward) -- Newcastle or Encephalomyelitis

Stubby neck feathers -- Neck Mites

Crop enlarged, hanging, bulging and hard -- Cropbound

Crop pendulous and soft -- Inflammation of Crop or Enlarged Crop

Body thin and emaciated -- Internal Parasites or Chronic Coccidiosis

Body thin and emaciated with swollen joints, causing lameness -- Tuberculosis

Abdomen hard, sometimes enlarged with lump inside -- Tumor or Internal Layer

Abdomen enlarged and soft, a substance like a sac of water is felt -- Dropsy

Filthy, pasty substance on feathers in the area of the vent -- Diarrhea

Mass of soft material protruding from vent combined with sticky moistness -- Prolapsed Oviduct

Broken or stubby feathers around vent -- Mites

APPENDIX C (Contd.)

Legs twisted, crooked, bowed, and swollen - Perosis or Rickets

Legs paralyzed or wings hanging limp - Fowl Paralysis, Range Paralysis, or Lymphomatosis

Shanks with scales standing out - Scaly Leg Mite

Swelling on bottoms of feet and between toes - Bumblefoot

## B. Sound

All respiratory diseases are easily detectable by sound. Approaching trouble is apparent when the birds gasp for breath, cough, sneeze, wheeze, and have rattles in their throats.

A representative of one of our large poultry concerns, who is an authority on the raising of broilers, tells of a sighted poultryman who is alert and very successful. During the darkness of the night, he heard a slight wheezing in the throats of one or two birds in his flock. This was, of course, an indication of approaching trouble. He immediately took preventive measures and an epidemic in his flock was averted.

Listed below are 9 major respiratory infections which may be encountered in the raising of poultry:

Newcastle Disease	Laryngotracheitis
Bronchitis	Chronic Fowl Cholera
Turkey Sinusitis	Aspergillosis
Chronic Respiratory Disease	Gapeworms
Infectious Coryza	

Three other sounds which indicate trouble, although not respiratory in nature are:

Weakened cry - Epidemic Tremor (Usually found in young birds)

Sharp cry frequently emitted - Rose Chafer Poisoning  
(More fatal to young birds)

Cry or squawk of exertion - Prolapsed Oviduct (Mature hens)



APPENDIX C (Contd.)

C. Smell

The presence of some diseases in poultry is detectable by smell. In certain diseases, birds suffer from infections, eruptions, and bowel disorders--all of which have unusually offensive odors that are distinctive from the usual poultry house smell.

Vent Gleet.--An unusually foul odor from the droppings and an offensive odor around the affected areas of the vent indicate the presence of the disease.

Although they have not been described in this material, certain other diseases, such as infectious coryza (rhinitis, roup, cold), fowl cholera, and rickets also emit unusually foul smelling odors and are definite indications of trouble.

D. Touch, Sound, and Smell

Many diseases, their signs, and symptoms, which are enumerated under touch, sound, and smell are detectable by one method or a combination of two or all methods.

DEPARTMENT OF  
HEALTH, EDUCATION, AND WELFARE  
Office of Vocational Rehabilitation  
Washington 25, D.C.

June 30, 1954

REHABILITATION SERVICE SERIES NUMBER 52 - APPENDIX C

TO: Divisions of Vocational Rehabilitation; Commissions and other  
Agencies for the Blind

SUBJECT: Appendix C, "Methods Used by Blind Persons in Detecting Signs  
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*M. I. Tynan*

M. I. Tynan, Chief  
Services for the Blind

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APPENDIX C (Contd.)

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APPENDIX C (Contd.)

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A representative of a large feed concern, who is an authority on the raising of broilers, has this to say:

"By keeping daily records of feed consumption, you can notice a decline as soon as it appears. This is a definite sign that something is wrong. Correcting a problem in its development is much easier than suddenly to find out your flock is 'off feed' and a serious respiratory outbreak is affecting the growth and uniformity of your broilers."

C. Falling Off of Egg Production in the Laying Flock

Progressive poultrymen, whether blind or sighted, keep close records of egg production. A falling off in the daily count indicates two conditions: (1) hens may be diseased or plagued with parasites; or (2) hens may be broody or going into a molt. After a season of heavy production a good layer has a rough unkempt plumage, and a poor layer has a clean smooth coat of feathers. Blind poultrymen can easily detect these conditions by examining the plumage of the hens with their hands.

III. EXAMPLES OF DISEASES, PESTS, AND COMMON AILMENTS IN POULTRY, THEIR SIGNS AND SYMPTOMS WHICH CAN BE DETECTED BY TOUCH, SOUND, SMELL, AND A COMBINATION OF THESE METHODSA. Touch

Many ailments in poultry are detectable by touch. Approaching trouble is apparent when the birds droop, are lame, squat, are listless, remain under foot, show a decrease in egg production, have a smooth glossy touch to their feathers, or there is a discharge from infected areas.

To keep themselves acquainted with the actions and conditions of the birds, alert poultrymen make daily checks of their flocks. Whether blind or sighted, they rely heavily on all the senses for information, although the sense of touch probably gives the most accurate picture of the development and condition of a bird.



APPENDIX C (Contd.)

When a poultryman's attention has been attracted by an unusual action, sound, or unfamiliar behavior on the part of a bird in the flock, he involuntarily picks up the bird and makes an examination. Careful inspection of the bird from head to foot will reveal the presence of certain conditions which indicate specific illnesses as follows:

Abrasions, nodules, or protuberances on comb and wattle -- Fowl Pox

Swollen conditions on one or both sides of beak -- Canker

Swollen eyes -- Roup

Secretion from eyes or nostrils -- Cold

Head hanging with neck limp or twisted -- Limberneck or Leukosis

Distorted head posture (tends to bend backward) -- Newcastle or Encephalomyelitis

Stubby neck feathers -- Neck Mites

Crop enlarged, hanging, bulging and hard -- Cropbound

Crop pendulous and soft -- Inflammation of Crop or Enlarged Crop

Body thin and emaciated -- Internal Parasites or Chronic Coccidiosis

Body thin and emaciated with swollen joints, causing lameness -- Tuberculosis

Abdomen hard, sometimes enlarged with lump inside -- Tumor or Internal Layer

Abdomen enlarged and soft, a substance like a sac of water is felt -- Dropsy

Filthy, pasty substance on feathers in the area of the vent -- Diarrhea

Mass of soft material protruding from vent combined with sticky moistness -- Prolapsed Oviduct

Broken or stubby feathers around vent -- Mites

APPENDIX C (Contd.)

Legs twisted, crooked, bowed, and swollen - Perosis or Rickets

Legs paralyzed or wings hanging limp - Fowl Paralysis, Range Paralysis, or Lymphomatosis

Shanks with scales standing out - Scaly Leg Mite

Swelling on bottoms of feet and between toes - Bumblefoot

## B. Sound

All respiratory diseases are easily detectable by sound. Approaching trouble is apparent when the birds gasp for breath, cough, sneeze, wheeze, and have rattles in their throats.

A representative of one of our large poultry concerns, who is an authority on the raising of broilers, tells of a sighted poultryman who is alert and very successful. During the darkness of the night, he heard a slight wheezing in the throats of one or two birds in his flock. This was, of course, an indication of approaching trouble. He immediately took preventive measures and an epidemic in his flock was averted.

Listed below are 9 major respiratory infections which may be encountered in the raising of poultry:

Newcastle Disease	Laryngotracheitis
Bronchitis	Chronic Fowl Cholera
Turkey Sinusitis	Aspergillosis
Chronic Respiratory Disease	Gapeworms
Infectious Coryza	

Three other sounds which indicate trouble, although not respiratory in nature are:

Weakened cry - Epidemic Tremor (Usually found in young birds)

Sharp cry frequently emitted - Rose Chafer Poisoning  
(More fatal to young birds)

Cry or squawk of exertion - Prolapsed Oviduct (Mature hens)

APPENDIX C (Contd.)

C. Smell

The presence of some diseases in poultry is detectable by smell. In certain diseases, birds suffer from infections, eruptions, and bowel disorders--all of which have unusually offensive odors that are distinctive from the usual poultry house smell.

Vent Gleet.--An unusually foul odor from the droppings and an offensive odor around the affected areas of the vent indicate the presence of the disease.

Although they have not been described in this material, certain other diseases, such as infectious coryza (rhinitis, roup, cold), fowl cholera, and ricketts also emit unusually foul smelling odors and are definite indications of trouble.

D. Touch, Sound, and Smell

Many diseases, their signs, and symptoms, which are enumerated under touch, sound, and smell are detectable by one method or a combination of two or all methods.





